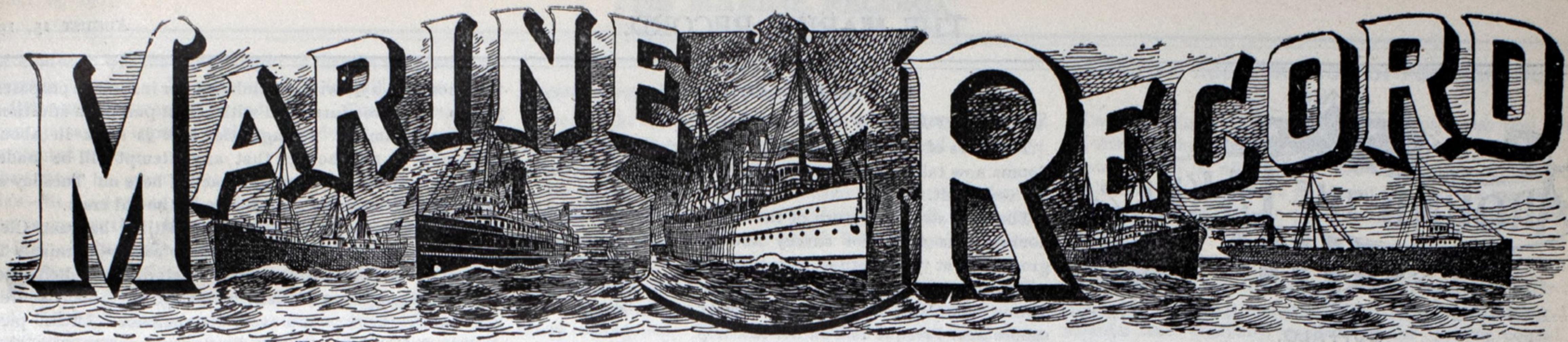


MARINE RECORD



ESTABLISHED 1878.

VOL. XXIV, No. 33.

CLEVELAND -- AUGUST 15, 1901 -- CHICAGO.

\$2.00 Per Year. 5c. Single Copy

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and to improve the character of the service rendered to the public.

PRESIDENT.

A. B. WOLVIN,
1ST VICE-PRESIDENT.

CAPT. J. G. KEITH,

SECRETARY.

CHARLES H. KEEP,

TREASURER.

GEORGE P. MCKAY,

COUNSEL.

HARVEY D. GOULDER,

EXECUTIVE AND FINANCE COMMITTEE.

JAMES CORRIGAN, Chairman,

COMMITTEE ON LEGISLATION.

GIBSON L. DOUGLAS, Chairman,

COMMITTEE ON AIDS TO NAVIGATION.

GEORGE P. MCKAY, Chairman,

Duluth.

Chicago.

Buffalo.

Cleveland.



BUFFALO.

Special Correspondence to The Marine Record.

Capt. Hollenberg is now master of the steamer Boston, vice F. J. Johnson transferred to the Syracuse.

On Monday 161,000 bushels of grain were shipped via the Erie canal, 101,000 bushels being wheat and the balance corn and barley.

Capt. W. W. Wilkins is now master of the steamer Uganda, vice Capt. George W. Starkey. The schooner R. Bottsford is in charge of Capt. Peter Johnson, vice Capt. Alex. Sharow.

Capt. John Fisher, of the steamer Syracuse, was compelled to lay off for a trip on account of sickness. His friends and shipmates will be pleased to learn that he has about recovered and will be all right again in a few days.

The Bertram Engine Works, Toronto, have under contract two large steel steamers, one for the Richelieu & Ontario Navigation Co.'s Montreal-Quebec passenger service, and a cargo boat for a Canadian syndicate of capitalists, both for delivery next spring.

The Standard Oil Co. tanker No. 52, Capt. Hansen took 5,000 barrels of naphtha from the pipe line docks, above the Export elevator, this week, consigned to Superior. She was built two years ago for the Imperial Oil Co., Montreal, but has been brought back to the lakes and will transport bulk oil in her tanks to Lake Superior.

It is understood that the Union Transit Co., owners of the steamer Avon, have turned her over to the underwriters. Two experts, one from New York and one from London have passed judgment on the burned vessel, and she is declared a total loss. The Avon will not be rebuilt. She will likely be purchased from the underwriters and converted into a tow barge.

The Northeastern reached here from her trip across the Atlantic on Wednesday. After discharging some tea and sugar, she will proceed on to Chicago and enter the lake trade for about a month, and then get down the St. Lawrence before insurance expires, say November 15, for a winter's knocking about on the coast. It was a nice thing for the boat to bring us some more tea and sugar.

The exhibit of the U. S. Fish Commission at the Pan-American is displayed in the south pavilion of the Government building. It occupies about 10,000 square feet of space and is primarily intended to show the functions of the U. S. Fish Commission as provided for by law. An effort has been made to illustrate the methods employed in the various fisheries and to show the products of the same. The exhibits are arranged under three general headings: Scientific Inquiry, Fish Culture, and Methods and Statistics.

It is said that one of the five boats contracted for this week by the American Ship Building Co. will come to this port. The steamers will range in size from 4,800 to 6,200 tons. The smaller boats will be sister ships to the steamer Mars, and the larger ones of the steamers ordered by the Hawgoods last week. They will have triple expansion engines, Scotch boilers, and will be fitted with Howden hot draft. The boats are to be completed April 15, 1902, and will cost about \$1,500,000. Capt. Brown, Cleveland, will be secretary and manager of the company, which is to be capitalized at \$2,500,000. Capt. Brown first figured on building ten steamers, and Charles Counselman, the Chicago grain shipper, and W. H. Prime, the underwriter, were going into the company. They decided to drop out of the project and Capt. Brown immediately cut the order in half. This order will make a total of twenty-five ships now under contract by the American Ship Building Co. Three of the boats will be built at Chicago, one at Detroit and one here. This order of building is understood to be subject to revision at the builders' option.

THE new exclusively anthracite coal dock of the C. Reiss company at Sheboygan was operated for the first time on Saturday and discharged cargo of the steamer Ira H. Owen. Its size is 350x400 feet, and outside of the steam hoists the plant is operated by electricity.

CLEVELAND.

Special Correspondence to The Marine Record.

Transfers of masters took place this week. Capt. Hiriam Cooms now takes the Tasmania and Capt. E. Biddlecombe the Gebhardt.

The steel steamer Saturn of the Gilchrist fleet will be dry-docked this week for survey and bottom repairs after grounding at the mouth of Detroit river.

Capt. C. C. Balfour has taken charge of the steel steamer Venus, vice Capt. W. C. Butts resigned. The steamer was ashore near Presque Isle on her last trip.

The committee on aids to navigation of the Lake Carriers Association are empowered to purchase an old schooner and fit her out as a light ship for Pelee Passage.

Capt. A. B. Wolvin, Duluth, Minn., president of the Lake Carriers' Association and general manager of the Pittsburg Steamship Co. (United States Steel Corporation), visited this port on Tuesday.

Lorain is in the swim as a safe port for large ore cargoes. The Smeaton was taken care of this week with 7,265 net tons on a draft of less than 18 feet. The Manila has the credit of the next largest cargo.

The Lake Shore Railroad Co. had dredges to work for a week at Ashtabula, and there is now a clear 20 feet depth at the drawbridge, so that it is thought vessels will no longer be detained by grounding at this point.

The Chicago and Northwestern Railroad Co., are building a breakwater at Sheboygan, Wis., to protect their shore line of rails. The Lake Shore Railroad Co. at this port, prefers such expense being shouldered on to the Federal Government.

The committee on aids to navigation of the Lake Carriers' Association are considering the purchase of another craft to take the place of the burned schooner Smith & Post, recently acting as a light-ship on Southeast shoal, Pelee Passage, Lake Erie.

Mr. J. A. Cleveland, a gentleman well known in local business circles, now represents the American Manufacturing Co., Wall Street, New York, manufacturers and wholesale dealers in cordage. Mr. Cleveland's office is on the 3rd floor Western Reserve Building.

Ashtabula has been jammed with vessels this week. Wednesday there were twenty-eight ore laden vessels and nine vessels loading coal at the docks. Sixty thousand tons of ore was afloat at the Lake Shore docks, every ton to go into cars for immediate shipment.

Owing to the successful workings and prosperous outlook of the American Ship Building Co., it is now on the tapis to devote a large amount of the accumulated earnings to paying a dividend on the common stock. This will be a very stratifying feature to the ordinary investor and stockholder.

There is an enormous risk taken in building tunnels out to cribs half way across the lake to secure water for the city. The Cleveland tunnel has called for about 50 lives and it is not yet finished as there is 2,600 feet to be completed. At least nine men lost their lives this week through the crib catching fire.

Word has been received that the lake built steamer Tam-pico, from Norfolk, Va., to San Francisco with coal has arrived all well. The Eureka and Meteor also built at the yards of the Craig Ship Building Co., Toledo, to the order of Messrs. Hawgood & Co., and afterwards sold to the Globe Navigation Co., are due to arrive in 'Frisco within a few days.

Capt. Thos. Macoubrey, master of the small English steamer Paliki, can't quite understand why firemen should be paid at the rate of \$45 per month. If, on the other side of the pond, he could load his craft down with engineers and mates, full of talent, vigor and skill at this entrancing per—yet, the Northwestern Steamship Co. were willing on their ignorance to buck against a score of little features like this, including insurance on extra hazardous risks. Well! they learned a lesson.

The following meteorological observations are furnished by the office of the U. S. Weather Bureau for the week ending August 14th: Prevailing wind directions during the week, north-west; highest velocity, 30 mi, from south, on the 19th. Mean temperature for the week, 72; highest temperature, 92 on August 9th; lowest, 57 on August 13th; sunrise and sunset data, computed for local time at Cleveland, August 15th, sun rises 5:07; sets, 7:01; August 18th, sun rises, 5:10; sets, 6:56; August 21st, sun rises, 5:13; sets, 6:52.

The schooner Thomas P. Sheldon, built in Saginaw, in 1871 and recently returned from the coast, foundered with her cargo of iron ore on Lake Huron, her crew escaped. The craft was 699 tons gross, owned by J. C. Gilchrist and rated

this month A 2½, with a valuation for insurance purposes of \$8,000. She was furnished with steam pumps in addition to the hand pumps. Though the hull is sunk in about 4 fathoms it is not thought that any attempt will be made to float her again. The mate reached here on Tuesday and reported having quite a hard time in the old craft.

A long pleasant day may be spent sailing between Cleveland and Canada on the favorite steamer *Urania*. The officers of the boat are attentive to their duties and courteous to the passengers, excellent meals are served on board at very moderate prices and every convenience is offered picnic parties at Rondeau, that is, ivy covered arbors with chairs and tables, also hot and cold water, hotel, pavilions, yachting, bathing, fishing, etc. At the present time anyone would say that Rondeau will become a favorite resort in a season or two and there is a desire evidenced to make it so. The Ontario law is against Sunday sailing though, or rather, you can sail all you want, but musn't land, so Cleveland people are barred out of a Sunday trip on the *Urania*.

DETROIT.

Special Correspondence to The Marine Record.

The schooner Thomas P. Sheldon is gone, and her towing steamer, the *Waverly* had a close call. The latter craft rates A2. and has a \$27,000 valuation for insurance purposes.

The twin screw passenger steamers Northwest and Northland passed each other in the river on Monday for the first time since they have been on the Chicago-Buffalo route. No small amount of steam was used in the mutual salutations.

The Homer Warren, nee *Atlantic*, is a propeller of 448 gross tons, built at Cleveland in 1862 and now owned by F. C. Andrews of this port. The old craft has been rebuilt and now figures on her first letter, rating A1½, with a valuation of \$35,000, rebuilding repairs, rejuvenates?

The West Bay City shipyard, branch of the American Ship Building Co. is to resume work although it had been partially dismantled. Detroit is now certain of as much work as can be carried on. The shipyards, engine shops and boiler works will have all they can do throughout the coming winter.

Capt. J. T. Hutton, formerly of the steamer A. A. Parker, will command the new steamer *Yosemite*. Capt. J. L. Millen, late of the steamer *Grecian*, will succeed Capt. Hutton in the Parker. Capt. C. C. Balfour, late of the steamer Chas. A. Eddy, has been given charge of the steamer *Venus*, one of the new Gilchrist freight steamers.

The old wooden steamer *Waverly*, Capt. D. Kirby, engineer John McGregor, led the schooner Thos. P. Sheldon ashore off Au Sable near the wreck of the *Baltimore*, while bound down last week with cargoes of iron ore from Escanaba, both vessels are now lying with their rails awash. The *Waverly* grounded heavily at False Presque Isle early in July while trying to release the steel steamer *Venus*.

The Gilchrist fleet of wooden craft are playing in hard luck these times. The steamer *Colonial*, Capt. F. Chilson, nearly made a hole in the water on Lake Huron, crossing Saginaw Bay with a cargo of iron ore, she was eventually got into Harbor Beach, where leaks were stopped and she came on passing here on Tuesday. This casualty knocks four of them out of time in the past few days, the *Saturn*, *Colonial*, *Waverly* and *Sheldon*.

The wrecking steamer *Favorite* released the whaleback steamer *Henry Cort* from her stranded position on St. Helena reef and sent her on her way rejoicing last Monday. The *Favorite* from her station in the Straits of Mackinaw is one of the best aids to navigation and commerce on the chain of lakes, not that she gets too much to do, but she is always on hand when wanted, and besides, she invariably accomplishes whatever she undertakes, or is ordered to do.

The several small tramp steamers flying the British flag are continually having trouble with their crews. The union wages for firemen is \$45 per month, and the Britishers can't understand paying chief mate's wages to an ordinary coal passer. The *Paliki* was held here for a day this week while the engineer was hunting up a couple of firemen. The vessels, like all others, should alter their rules according to the trade they are in; river, lake, coast and ocean sailing differs all 'round.

The wreckers around Harbor Beach captured jettisoned lumber and when Mr. F. E. Chamberlain sought to recover a portion of the 70,000 feet thrown overboard from his vessel, he was insulted and had to get out a writ of replevin to obtain his own property again. There perhaps was no revenue attached to it, but the revenue cutters and the man-of-

fight stationed on the lakes ought to make a semblance of preserving law and order and especially in telling wreckers the difference between mine and thine. The ownership of flotsam, jetsam or lagan is seldom abandoned or repudiated in protected waters.

They must be great wreckers, regular Cornish—West—Indian—St. Lawrence sea robbers around East Tawas if the report is correct that comes through here. Covetous hands were laid on the outfit of the Baltimore but they were actually quicker at their job on the foundered schooner Thos. P. Sheldon. The revenue cutters, instead of trying to umpire a Lake Michigan yacht race, or acting as local patrol boats on matters entirely out of their province, should get around to wrecks occasionally and try to uphold the majesty of the law, or at least look out for the property of citizens whose payment of taxes makes possible their sinecure positions. The Revenue Cutter Service doesn't cut very much of a figure on the lakes.

"Alas, poor Yorick," but I suppose it is, as To Day, one of Detroit's best daily newspapers says it is, maritime terms have changed. To Day very pertinently remarks that sailors, as a rule, do not like to buckle down to study, nor to acquire a new nautical vocabulary, but they find that maritime terms and methods have changed materially since the oldest of them used to "splice the main brace." Machinery has displaced sail power to such an extent that a sailor rarely has to go aloft. And on warships no one ever now hears the order to "run out the studding sail boom," or "lay aloft and lose the 'topgallantsail,'" nor is the title of "captain of the top" as common as of old. Bowlines, reef points and many other terms are becoming unknown to the seadogs. And now another change is threatened. The sea term of "starboard" and "port," familiar to landsmen as well as seamen, are to be displaced in the near future by the terms "right" and "left." If the changes of old fashioned terms and conditions on shipboard are to go on it may not be long before mariners will drop "deck" and "gangway" and "fo'castle" and "cabin" for more modern names. Ah! so it goes; screw propellers will no doubt soon become coffee mills and side-wheels marine churning, bulwarks may be turned into fences, while ports and gangways be known as lesser and greater gates, etc. Even compass terms are threatened.

DULUTH-SUPERIOR.

Special Correspondence to The Marine Record.

The head of the lakes is receiving more attention from the U. S. Revenue Service than ever before, also from the Steamboat Inspection Department. Knowing this, people still insist upon taking chances, and the latest scapegoat is the owner of the tug Lyric, charged with not keeping her inspection license up to date. The fine is \$500, but probably Mr. Witt, her owner, may find reasonable grounds for the temporary violation and secure a remission of the penalty. The screw is applied here and there in a spasmodic sort of a way, and wherever and whenever the fit seems to take the government officers. It goes without saying that marine people should be very careful when they find a district marked out and attacked for slight technical violations of the spirit of the law.

The minor claims, such as for lost baggage, etc., through the burning of the small passenger steamer Bon Voyage, on Lake Superior, last May, are being settled as promptly as possible through the owner's attorneys, Messrs. Davis, Hollister & Hicks. As to the responsibility for the loss of life the government inspectors of steamboats have not yet rendered their decision. They are still looking the matter up and are being assisted by the inspectors at other districts. Their investigation so far has been exhaustive and they insist that they will not cease their work until they are satisfied that they have probed the case to the very bottom, that is, obtained all the evidence regarding the casualty. The best possible evidence of the vessel being burned is her charred hull, but inspectors are chary of charging incompetence on the part of men whom they have certificated themselves.

A BOTTLE which was recently found floating in Tampa Bay, Florida, contains a bit of paper with this message: "Lost off Havana harbor, steamer Crescent, April, 1899." This was signed by three names, purporting to be the names of three seamen on board the vessel. The steamer Crescent was wrecked somewhere between the harbor of Havana and Colorado Reefs about the time mentioned. If this bottle came from where it purports to have come it establishes the existence of a cross current in the Gulf.

CHICAGO.

Special Correspondence to The Marine Record.

The freight rate on grain from New York to Liverpool or Glasgow is now quoted at 2 cents. This time last year it was over 7 cents, and 4 cents is a low average.

The grain movement from Chicago and Fort William to Georgian Bay promises to be very brisk this fall. The Canada-Atlantic Line will likely add to its tonnage by chartering ahead and for more than single trips.

The steamer John Craig, with coal, grounded on La Salle street tunnel on Monday night and was released after two hours towing, etc. The steamer Arthur Orr was held above the tunnel, and the Syracuse at Clark street until the jam was cleared up.

Mr. Keefe, president of the International Longshoremen's Association, will leave here next week for New York, where he will take a boat for London. Mr. Keefe goes abroad as a representative of the association, of which he is the head, the aim being to form such an organization among the dock workmen of England and the continent.

Orders for about 12,000 tons of steel in plates and shapes were placed for shipbuilding purposes this week. Contracts are yet being figured on for some more new tonnage, two steel steamers is the addition to the lists of the American Ship Building Co., and two more are looked for if berths can be arranged and early delivery for next season assured.

Strike or no strike, shipbuilding contracts are being regularly placed just the same. This week an order for five more large cargo steamers has been placed with the American Ship Building Co., and it is safe to assume that delivery of material was guaranteed before structural contracts were signed. Three boats booked ahead will be transferred to the new contractors, so that material for two boats was probably all that needed to be figured on.

Shipments of grain from Chicago and South Chicago last week aggregated 2,130,000 bushels, of which 1,264,000 bushels were wheat. There was a decrease of 225,000 bushels from the previous week. The feature was the increase in the movement to Canadian ports of 723,000 bushels, the total shipments being 915,000 bushels, the largest of the season. It was due to there being a fleet of ocean steamers at Montreal that had to have grain, and it was sent there as fast as boats could be secured. The shipments to Buffalo were 998,000 bushels, a decrease of 63,000 bushels. Shipments to Ogdensburg were 148,000 bushels. Contrary to the indications expressed a couple of months ago, there has been a surplus of Atlantic tonnage at Montreal ready to accept a low ocean rate of freight on bulk cargoes for immediate loading.

The twin-screw passenger steamer North West, which was due here on Tuesday afternoon, did not arrive until 4 o'clock Wednesday afternoon, being twenty-six hours overdue on the trip up. The officials of the line here stated that the boat was eighteen hours late in leaving Buffalo, on account of repairs being made to her propeller. The extra eight hours lost on the trip was probably due to her boilers, which have caused considerable trouble on both the boats. There were many inquiries made by friends of the passengers aboard over the non-arrival of the steamer, although it was felt certain that no serious trouble could have occurred to the big fast liner. It is perhaps about time that the representative in this country of the Belleville type of water tube boilers took another look over the steam generators of the North West and North Land. Mr. Coryell has always blamed the firemen, but even the best of lake firemen can't work well unless they are given a fair show.

The Railway and Engineering Review is pleased to let the promoters of the Chicago-Atlantic line of steamers down easily in stating that "Chicago's career as a seaport has been even briefer than we anticipated. The four vessels built to ply between Chicago and European ports are to be put into the lake carrying trade. The reason is stated to be excessive rates of insurance charged through Lloyd's. The officers claim that these rates are prohibitory and that they are not warranted by conditions." As a matter of fact, the officers were novices, though, like the boy at his prayers, "they thought they knew all about it." The RECORD gave their manager about three months to learn something about the trade, and he has been middling apt at his lesson, but how he blinded agents and brokers, shippers and consignees, is a poser, by his gabble I suppose, but then he must have whistled a little too, as he paid for a good deal of it, and is not through yet. The London, Liverpool and Hamburg agents will need to snicker when offered cargo on direct through bills of lading, still, I notice advertisements yet in foreign shipping papers.

CANADIAN REGISTRATION OF FOREIGN-BUILT SHIPS.

Canada's right to tax foreign-built ships is the real issue involved in the case of the Algoma Central Ry. Co. vs. the Crown which is now before the Exchequer Court, and, doubtless, whichever way judgment is given the case will be appealed to the Judicial Committee of the Imperial Privy Council.

The A. C. K. Co. contests the right of the Dominion Government to tax the United States steamer Minnie M. under the following circumstances. After purchasing the steamer the company applied to the British consul in Chicago, who in accordance with the British merchants shipping act issued to the vessel a conditional British register good for six months within which time the vessel would have to apply to a British port for a permanent register. When application was accordingly made at Sault Ste. Marie, Ont., for such certificate of British registry, the collector of customs before issuing the certificate exacted duty to the amount of \$3,500 on the vessel. This he did under section 409 of the customs tariff, which reads: "Ships and other vessels built in any foreign country, whether steam or sailing vessels, on application for Canadian register on the fair market value of the hull, rigging and all appurtenances, except machinery, 10%, ad valorem; on the boilers, steam engines and other machinery, 25% ad valorem."

The application made by the owners of the Minnie M. was for a "British" register, in a British port, and they contend not only that it could not be refused in view of the provisional register granted by the British consul in Chicago, but that its issue in a British port could not legally be made conditional upon the payment of a duty or tax. Of course the contention of the customs department is that the government has the constitutional right to tax any foreign article coming into the country for use. But the fact remains that had the Minnie M., after receiving her temporary register at Chicago, been sailed to Liverpool she would have been granted a permanent British register there without fee; with that certificate of register, constituting her a British ship, the vessel could not be hindered from engaging in the coasting trade in Canada just as if she had been built and registered in this country. As a matter of fact there is no such thing as a "Canadian" register; and the customs tariff act would perhaps be better worded if it read, "on application for registry as British ships in Canada." However, under the tariff as it stands duty has for years been charged under conditions similar to those under which the Minnie M. was taxed, and the validity of the tax had never been called in question until the owners of the Minnie M. put up the contention that it is in contravention of the Imperial registration policy.

Collision—Steamer and Tow—Tug and Tow Drifting.—The tug Chase had taken out a tow from the south side of a pier at Communipaw by a line, and, when 150 or 200 feet beyond the end, stopped to make the tow fast to her side. The action of the tide carried both vessels northward some 150 or 200 feet, and about opposite the center of the adjoining slip, which was 300 feet wide. While in that position, the steamer Newark, coming down the river, and desiring to enter the slip, signaled, but received no answer. She made a second signal, and then slowed, but did not reverse nor change her course until within 200 feet of the tow, and came into collision with it. Held, that both steamer and tug were in fault for the collision—the former, for not reversing sooner, when her signals were not answered, or changing her course, which she might have done by going nearer the piers, and still entered her slip; and the tug, for failing to keep a lookout at the stern while the vessels were being drifted in that direction, and for not giving attention to and answering the signals of the steamer, the duty of care to avoid collision being as imperative in her situation as though she were actually being navigated. The Senator D. C. Chase, 108 Fed. Rep. (U. S.) 110.

Foreign Seamen—Complaint of Insufficient Food—Jurisdiction Declined.—A number of British seamen who shipped in England on a British vessel for a voyage to the United States and return made repeated complaint of the insufficiency of the food furnished. On arriving at New York a partial examination of the matter was made by the British consul on the oral complaint of the men, and he directed that a written complaint be filed, and that a thorough examination be made thereon. The men filed no such complaint, but left the ship, and brought suit in a court of admiralty to recover their wages. Held, that in the absence of proof of oppression or gross hardship, or that they would not be accorded a fair and impartial hearing by the consul in accordance with British shipping act, the court should decline jurisdiction. The Heathcraig, 108 Fed. Rep. (U. S.) 419.

THE TRANSVERSE STRENGTH OF SHIPS.*

Mr. J. Bruhn read portions of his paper on "The Transverse Strength of Ships," which was accompanied with several elaborate tables. He said in a paper read before this institution in 1882 by the late Messrs. Read and Jenkins, attention was called to the fact that the question of transverse strength of ships had not received the consideration it deserved. The remark was perhaps as true now as then. The longitudinal strength has come to be looked upon as the strength of a ship to such an extent that, whenever the calculated strength of a ship is mentioned, no other is usually thought of. The longitudinal bending moments being so much larger than the transverse ones, it follows that the longitudinal strength is more important than the transverse, but it is so only in regard to the quantity of material used in the construction. From the point of view of the safety of the ship and cargo, the strength of no one part of the structure can claim to be more important than that of other parts. If the cargo or ship is damaged, it matters little whether the cause is longitudinal or transverse weakness. It is, therefore, desirable to have a method whereby the transverse strength of a ship can be estimated as exactly as the longitudinal strength, or practically so. The object of his paper was to attempt to provide at least another step towards the establishing of such a method. The distribution of the material in the longitudinal girder is comparatively simple. The breadth, depth, and form of the girder being practically given, and the strength can only be varied by modifying the thickness of the plating. It is otherwise with the transverse material. Here the efficiency, or the strength, lightness, and compactness of the structural arrangement, depends to a much greater extent on the form and distribution of the material. In this case there was much more freedom in the design of the structural parts. It is, therefore, all the more important to have a method whereby the stresses can be estimated, and as, moreover, the case is somewhat more complicated than that of estimating the longitudinal strength, the chances are that the employment of a scientific method will detect greater room for improvements in design in this respect. The transverse stresses were those tending to change the form of the cross sections of the vessel. They were due to transverse forces acting on the ship, and, indirectly, to longitudinal forces. The transverse forces were: (1) The weights of the structure and cargo. (2) The reactions of these weights due to changes in the motion of the vessel (rolling, pitching, or heaving). (3) The externally applied forces, such as the pressure of water, keel blocks, or other supports. The longitudinal forces that affect the transverse strength of a ship are chiefly those which bend the vessel in a fore and aft plane, and, consequently, tend to deform the transverse sections. For convenience in the examination of the transverse strength of a ship, Mr. Bruhn assumed a section cut out of the vessel, and then applied all those forces to it which are necessary to keep it in equilibrium under the given conditions. This ring must be in equilibrium. The weight of the structure and the cargo, the pressure of the water, and the bending and direct stresses on the ring and the corresponding cargo be equal to the displacement. The vertical main forces are thereby balanced. The pressure of water on the two sides of the vessel will of course always be equal in still water. The ring, as a whole, is therefore in equilibrium. If we assume the deck beam removed, then the structure is simply firm, and the stresses are directly determinable by statistical means. When, however, the beam is fitted, then there will be a force and a bending moment which will resist part of the forces, but how large a part cannot be directly determined by the ordinary conditions of moments. Messrs. Read and Jenkins adopted, as the additional requirement necessary for the solution of the problem, the conditions of continuity in the deflections of the structure, and they determined by these means the forces in the case of vessels resting on keel blocks in dry dock.

The most direct method for the solution of a problem of this nature is, however, probably that based on the principle of least work. The systematic application of this principle to engineering problems is mainly due to Alberto Castiglione, of Turin. His methods have been extensively employed by civil engineers on the continent; but have not, hitherto, been applied to ship calculations, although ex-

ceedingly useful, not only in calculations for the strength of the main structure of a ship, but also in the determination of the strength of many details of the structure, such as rudders, stern forgings, masts, and rigging, etc. The very general character of the method and the possibility of employing the ordinary rules for approximate integration makes it peculiarly applicable to the unsymmetrical structure of a ship. Mr. Bruhn showed that transverse bulkheads are very important factors in the athwartship strength of ships. Their effect must be transmitted to the frames and beams through the shell plating, deck plating, and stringers. As regarded the force which is introduced by the heavy blows of waves striking a vessel, it should perhaps be estimated at about .2 of a ton per square foot. It would, obviously, be not so great as the action of a heavy sea upon an immovable mass such as a pier head or sea wall, which would not yield to the influence of the blow. This last was calculated by Mr. J. Stevenson to be 3 to 3½ tons per square foot for Atlantic waves striking a vertical wall or rock. Appended to the paper is a table of the calculated stresses on the framing of various vessels, worked out on the author's basis.

Mr. B. Martell said that the great advantage of Mr. Bruhn's paper consisted of the fact that it was a scientific investigation of a complete nature, tending to practical results, and would therefore enable shipbuilders to follow the investigations and arrive at more certain results in regard to the problem under discussion.

Dr. Elgar said that transverse strength was a much more complicated problem than longitudinal strength; and he thought, indeed, it was an interminable problem. The principle of least work leaves it necessary to make some assumption; still, he thought that principle was an advance. The author had referred to the support given by transverse bulkheads in resisting stresses. The speaker agreed that the principle element of strength in the transverse form are the transverse bulkheads, so that these afforded not only safety against flooding, but also added to the strength of the ship. He was not disposed to go so far as the author in considering that the bulkheads would relieve the framing almost entirely. Any results obtained by statical calculations in still water was over-ridden by the result of waves upon ships at sea.

Mr. J. Foster King referred to that part of the paper in which the author dealt with the bending of the floors. Mr. Bruhn had stated that an examination of the curve and the moments of the structure, cargo and water pressures would show that the horizontal pressure of the water on the sides of the vessel is the most important factor in determining the magnitude of the stresses, because, although the pressure of the water on the bottom is somewhat in excess of that of the weight of the structure and cargo, and the floors might therefore be expected to bend inwards, the pressure on the sides is sufficient to completely reverse this bending tendency, so that the largest bending moment on the girder is at the center of the floors, and is tending to bend the floors outwards. Mr. King considered this matter required explanation, and referring to a later passage in the author's paper in which it was stated that the frames may also be supposed to be held rigidly fixed at the lowest complete tier of beams, in particular when the beams are loaded with cargo, and, therefore, tending to bend the frame in a contrary direction to that due to the pressure of the water. Mr. King considered this was the reverse of what would be expected from a practical point of view. He was also of opinion that Mr. Bruhn argued to wrong conclusions when he said racking strains were small in sailing ships because there were few bulkheads. Mathematical calculations founded on so many unknowns, which must remain unknown, could not give satisfactory results.

Professor Biles said, while deductions from such a paper must be carefully made, he considered that Mr. Bruhn had made a distinct advance into the unknown regions of the strength of vessels.

Mr. Bruhn, in his reply, said he had not attempted a complete solution of the problem of the transverse strength of vessels, but had attempted in his paper to give a method for comparative purposes.

THE INVENTION OF THE MARINER'S COMPASS BY FLAVIO GIOJA IS TO BE CELEBRATED THIS SUMMER AT AMALFI, ITALY. Gioja came from Positano, in the hills back of Amalfi. There have not been wanting those who contend that the invention, like most others, was gradual, and that the tendency of the magnetized needle to point north was known long before Gioja's time, it even having been familiar to the Chinese.

*From an address read before the Institution of Naval Architects at Glasgow, June 25.

THE THERMOMETER.

It is probably not generally known, says Popular Science Monthly, that the thermometer was invented by Galileo. When we remember that we owe to this one man not only the foundations of physical science, but also in large measure the pendulum, the compass, the telescope and the microscope, it may lead to a certain amount of modesty in our appreciation of modern inventions.

Galileo, probably in 1595, invented the open air thermometer. Ferdinand II., of Tuscany, first sealed the glass, making the instrument independent of atmospheric pressure. Many improvements were gradually made, especially in the endeavor to fix points on a definite scale, the freezing point of water being first used by Robert Hooke in 1664. Of the three thermometers still in use, Fahrenheit's thermometer was invented in 1709, Reaumur's instrument is 1730, and the scale of Celsius—the centigrade scale—in 1742. None of these thermometers, however, is now used in the form in which it was originally devised. It is a somewhat curious fact that the instrument constructed by the German, Fahrenheit, is used almost exclusively by the English-speaking peoples; that invented by the Frenchman, Reaumur, is used chiefly in the north of Europe, while that of the Swede, Celsius, is used in French-speaking countries. The centigrade scale, the zero point of which is the freezing point of water, is now used nearly universally in scientific investigations. The main objection to its common use is the length of the degree, the interval between the freezing and the boiling point of water being divided into 100 instead of 180 degrees, as on the Fahrenheit scale. This makes the length of a centigrade degree nearly twice—nine-fifths—that of the more familiar Fahrenheit degree.

HOME DEVELOPMENT.

To the Editor:—The MARINE RECORD is one among the very few papers which has the wisdom to advocate the construction of home ship canals and the development of the great lake region, and render "Uncle Sam" independent of a foreign nation. The construction of the Nicaragua canal is wholly unnecessary. It would cost nearer \$1,000,000,000 than \$140,000,000. The Ocha dam and the locks of the canal will cost \$140,000,000. The excavation of a harbor on the east terminus of the canal and the breakwater on the Pacific coast, the construction of a railroad along the canal and dredging the lake will cost enormously. It is asserted that Lake Nicaragua is subsiding; the rainfall, in some seasons, is only 16 inches, and as the country is subject to volcanic actions, the permanency of the lake is uncertain. The legislator who votes the people's money for the Nicaragua canal is committing a great mistake; one-fourth the cost of that canal will furnish a deep water way from head of Lake Erie to the Gulf of Mexico, and will accommodate \$100,000,000 tonnage which will in a half score years be \$200,000,000.

Yours truly,

QUAKER.

THE STEAM TOWING MACHINE.

The following letter should be of interest to every one connected with water-borne commerce. The fact that the towing machine on the tug Vosberg is No. 0, the smallest size manufactured by the American Ship Windlass Company, makes the value of such a machine more easily comprehended:

SUDDEN & CHRISTENSON, LUMBER AND SHIPPING,
6 CALIFORNIA STREET,
SAN FRANCISCO, August 5, 1901.

G. M. Josselyn & Co., San Francisco, Cal.

Dear Sirs:—Relative to the Providence towing machine recently placed on the tug George R. Vosberg would say that Mr. U. S. Bryant, who is in charge of same, has reported to us that he considers the machine an excellent addition to the tug, and that same has, in his estimation, paid for itself in the first trip over the Nehalem in saving the barge which was in tow from destruction on the bar.

Immediately on the grounding of the barge the machine paid out cable enough to permit the tug to pass over the bar, and then with the combined power of the tug and towing machine the barge was hauled off the spit.

Mr. Bryant states that he considers the tug power increased one-third by the use of the machine.

Yours very truly,
(Signed) SUDDEN & CHRISTENSON.

THEORY OF ORIGIN AND CAUSE OF THE GULF STREAM.

CAPT. B. F. SHERBURNE, EUREKA, CAL.

For more than a century scientists and philosophers have been vainly trying to discover the origin and cause of the mysterious current in the Atlantic ocean called the Gulf Stream; why so called is not apparent, as nothing in the Gulf of Mexico is in its composition. There have been many theories which have been abandoned, some perfectly absurd, such as its being caused by the earth in its revolution on its axis; for if it had the power to draw this stream at the rate of five miles an hour from the coast of Florida it would draw all the water from the east coasts of North and South America at the same velocity. The prevailing theory is that the northeast trade winds drive a current into the Caribbean Sea, and, aided by the feeble equatorial stream, heaps up the water in the Gulf of Mexico, thence rushing around the south of Florida from the source of the Gulf Stream. But there is no such a heaping of the waters in that gulf. The waters there are sluggish, and there is no perceptible current leading towards the Gulf Stream, or anywhere else. This theory has been accepted for want of a better, but those who favor it are not entirely satisfied with it. The Gulf Stream is an independent body of water, having no connection with the water around or behind the point where it emerges. It is warmer and of a deeper blue than the surrounding seas and gushes forth from the starting point off Cape Sable at the rate of from five to six knots an hour, with a temperature of about 90 degrees, lessening gradually as it proceeds on its journey of thousands of miles across the Atlantic ocean, warming the western shores of Europe.

Having seen the fallacy of the theories concerning the Gulf Stream, we will turn our attention to the great Pacific current, identical in all respects with its sister current of the Atlantic, and concerning which there are no theories to contend with.

It starts spontaneously from a spot a few miles from the south end of the island of Formosa, in the Banshee channel, following the coast of Formosa northeasterly, past and through the Loo Choo islands, skirting the coast of Japan; thence turns eastward on its long journey across the wide Pacific, warming the coast of America from Puget Sound to Mexico. Its dark blue waters are in striking contrast to the surrounding seas, giving it the name of Murra Suar, or black water. It is an independent stream where no combination of winds or currents can possibly cause the mighty rush of warm blue water with a velocity of from five to six knots an hour from the start.

In its characteristics of heat, color and direction it resembles the Gulf Stream in every particular, and the origin of the two streams must be the same, whatever they may be, which I shall endeavor to show later on. There is another ocean current similar in all respects to the other two, with the exception that it runs in an exactly opposite direction. Starting from the vicinity of the south end of the island of Madagascar, it runs southwesterly around the Cape of Good Hope, where it disappears off Cape Agulhas. As a current, probably a part of it is diverted into a steady set of the easterly current, caused by the prevailing westerly winds in that region. No scientists, so far as I am aware, have attempted to account for this current.

Having now proved beyond refutation that all theories advanced as to the cause of ocean currents are groundless, it remains to be proven what the true cause is.

It must be admitted that the currents have a similar origin, as they are identical in every respect as regards color, heat and velocity, springing forth in the same manner spontaneously from the earth in some mysterious way. There is no place on the surface of the earth where the water can be heated to furnish the heat contained in these streams that gush forth from the depths of the sea; consequently the forces must be subterranean, and can only be accounted for by large bodies of clear, blue water from the ocean forcing its way into the depths of the earth under its crust, where it burrows a channel of its own to the surface again, having received its warmth on the way by contact with the internal heat of the lower regions of the earth, forced on by continual pressure from behind. That there are orifices in the earth's crust cannot be denied, also what becomes of the vast column of water that cannot be computed which is constantly running at the rate of from four to six knots an hour from the Atlantic ocean, through the

Straits of Gibraltar into the Mediterranean Sea. The numerous rivers, too, are continually flowing in, and yet the sea remains at the same level. Evaporation cannot account for it, for what is evaporated is formed into clouds and is precipitated again into the sea by the medium of storms and frequent rains.

The water must enter the earth from the ocean through these apertures on an incline, as it gushes forth in these three mighty currents and cannot be discovered by soundings; consequently these three mighty currents are nothing more or less than immense geysers

THE SPLICING OF WIRE ROPE.

Our caption is the title of a well printed catalogue of fifty or more pages now ready for distribution by John A. Roebling's Sons Co., Trenton, N. J. The catalogue is printed on heavy coated paper and bound in green cover with gold lettering. The subject of splicing ropes is very fully covered by complete descriptive matter, and there are probably two dozen full page illustrations, showing the process in much detail by which wire ropes are spliced. The back part of the catalogue is devoted to illustrating and describing the different kinds of wire rope manufactured by this company. These include hoisting rope, haulage rope, galvanized wire rope, steel hawsers, etc. A number of riggers' tools are also shown, and there are several pages of illustrations of sockets, turnbuckles, and other specialties used in connection with wire rope. The catalogue is one of particular interest to those who have to do with the rigging of vessels and the practical handling of wire rope.

STATEMENT OF THE VISIBLE SUPPLY OF GRAIN.

As compiled by George F. Stone, Secretary Chicago Board of Trade, August 10th, 1901.

CITIES WHERE STORED.	WHEAT, Bushels.	CORN, Bushels.	OATS, Bushels.	RYE, Bushels.	BARLEY, Bushels.
Buffalo	768,000	279,000	398,000	38,000	64,000
Chicago	4,071,000	7,374,000	736,000	140,000	2,000
Detroit	306,000	51,000	44,000	49,000	3,000
Duluth	1,355,000	1,482,000	508,000	95,000	46,000
Fort William, Ont.	426,000	.....	.....	.....	.....
Milwaukee	228,000	667,000	68,000	13,000	17,000
Port Arthur, Ont.	45,000	.....	.....	.....	.....
Toledo	516,000	451,000	317,000	157,000	3,000
Toronto	29,000	.....	8,000	.....	50,000
On Canals	515,000	155,000	79,000	.....	.....
On Lakes	965,000	656,000	110,000	22,000	.....
On Miss. River	.....	.....	.....	.....	.....
Grand Total	28,219,000	13,296,000	4,452,000	732,000	320,000
Corresponding Date, 1900	48,218,000	11,351,000	5,869,000	625,000	350,000
Increase for week	.....	692,000	98,000	76,000	7,000
Decrease	2,150,000	.....	.....	.....	.....

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—NEW YORK.

TREASURY DEPARTMENT, OFFICE OF THE LIGHT-HOUSE BOARD.

WASHINGTON, D. C., August 8, 1901.

CAPE VINCENT BREAKWATER BEACON LIGHTS—Notice is hereby given that, on or about August 31, 1901, a fixed red lens-lantern, 25½ feet above the mean level of Lake Ontario, and illuminating the entire horizon, will be established on each of the two structures now being erected on the ends of the breakwater off Cape Vincent, southerly side of the head of the St. Lawrence River.

Each of the structures stands about 20 feet from its end of the breakwater, and is a small, square, white, wooden house, with pyramidal roof, above which rises two uprights.

By order of the Light-House Board:

N. H. FARQUHAR,
Rear-Admiral U. S. Navy, Chairman.

LIGHT-HOUSE ESTABLISHMENT.
OFFICE OF THE LIGHT-HOUSE INSPECTOR, ELEVENTH DISTRICT.
DETROIT, MICH., August 9, 1901.

ST. CLAIR RIVER, MICH.—Notice is hereby given that the color of the spar buoy recently established to mark the position of the sunken crib on the shoal at the head of Russell Island, St. Clair River, Mich., has been changed from red and white horizontal stripes to red and black horizontal stripes.

By order of the Light-House Board:

J. C. WILSON,
Commander, U. S. N., Inspector 11th District.

SHIPPING AND MARINE JUDICIAL DECISIONS.
(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Passing Without Answering Signals.—Under special rule 5, governing the navigation of St. Mary's river, which requires an overtaking steamer desiring to pass, at any place where that is permitted, to signal, and the forward vessel to answer such signal, either assenting or dissenting, such agreement by signals is essential to authorize the overtaking vessel to attempt passing, and she is not justified in taking the failure of the forward vessel to answer her signal as an assent to the passing, and in acting upon it as such. The North Star, 108 Fed. Rep. (U. S.) 436.

Treaties—Construction of Treaty with Russia—Surrender of Deserters from Ships.—Article 9 of the treaty of 1832 between the empire of Russia and the United States, which authorizes consular officers of either country to apply to the competent tribunals of the other for the arrest, detention, and surrender of deserters from "ships of war and merchant vessels of their country," and provides that such deserters shall be surrendered "on proof, by the exhibition of registers of vessels, the rolls of the crew, or by other official documents, that such individuals formed part of the crews," cannot be extended beyond its terms, so as to apply to deserters generally; and it does not authorize the arrest and detention by the authorities of the United States, on application of a Russian consul, of a member of the Russian navy who, with others had been sent to this country, in charge of an officer, to form part of the crew of a cruiser being built here for the Russian government, but which had not been completed or accepted, or its crew organized, at the time such person deserted. Motherwell et al. vs. United States ex rel. Alexandroff, 107 Fed. Rep. (U. S.) 437.

Shipping—Injury to Cargo in Port—Negligence.—After a barge had been loaded with a cargo of wheat in January, and while lying in the Chicago river, awaiting the opening of lake navigation in the spring, a drain pipe which passed through the hold above the wheat, and the lower part of which was below the surface of the river, so that it remained full of water, froze and burst, and water from the river ran in upon the cargo. The shipkeeper in charge for the owners knew that water was entering the vessel, but, on the supposition that it came in from a different place, made no examination for a month, although he could easily have done so; and during all that time the water continued to run in upon the wheat, doing it serious damage. Held, that the result should reasonably have been anticipated, and that, moreover, the keeper was guilty of gross negligence, which rendered the owner of the vessel liable for the injury to the cargo, irrespective of the obligation assumed under the bill of lading to deliver the cargo safely at the port of destination, dangers of navigation, fire, and collision alone excepted. Northwestern Transp. Co. vs. Leiter, 107 Fed. Rep. (U. S.) 953.

Partial Loss—Deductible Average.—A marine policy on a steamship contained two separate valuations, one including the "hull, tackle, apparel, furniture, stores, outfit, fittings, electric light plant, and dynamo," and the other the "engines, propeller wheel or wheels, boilers, and machinery." It contained clauses providing that, "in the event of particular average, the assurers only to be liable for the excess of one-half per cent upon the entire value," and "average payable on each valuation as if separately insured, or on the whole." Held, that the effect of the latter clause was to entitle the assured to treat the policy as a single policy on the whole, or as two separate policies, for the purpose of computing the deductible average in case of a partial loss, and that in case of a loss by injury to the hull in collision, which did not affect any of the items included in the second class, the half per cent deductible under the franchise clause should be computed only on the amount of the first valuation; the words "entire value," as used in the first clause, having reference in such case to the class of which the hull formed one item, as the subject of separate insurance. American S. S. Co., Limited, vs. Indemnity Mut. Marine Ins. Co. Limited, 108 Fed. Rep. (U. S.) 421.

Contract by Carrier to Insure.—It was stipulated that the consignors received the steamship company's written assurance that the shipment of wool under the insured rate would carry marine insurance, and that it was to "cover the shipment" with marine insurance; and it further appeared that the company, in accordance with its custom, insured in its own name the goods of all shippers on the vessel entitled to be covered by insurance in a lump sum, as well as covering by the same policies its own liability as carrier; the loss being made payable to its agents or their order. Also that, there having been a loss of a portion of the cargo, it collected by its agents the insurance payable to other shippers, and distributed it, omitting payment to the consignors of the wool only because the insurers denied liability because of the policy taken by the consignees. Held, that it was a reasonable inference from such facts that the contract with the consignors contemplated that the company should insure in its own name, and, in case of loss, collect and pay over the insurance; and that, having failed to do so, the consignors could maintain an action against it for the amount. Gross et al. vs. New York & T. S. S. Co., 107 Fed. Rep. (U. S.) 516.



ESTABLISHED 1878.

Published Every Thursday by

THE MARINE RECORD PUBLISHING CO.,
Incorporated.

C. E. RUSKIN,

CAPT. JOHN SWAINSON,

Manager.

Editor.

CLEVELAND,

Western Reserve Building.

CHICAGO,

Royal Insurance Building.

SUBSCRIPTION.

One Copy, one year, postage paid,	\$2.00
One Copy, one year, to foreign countries,	\$3.00
Invariably in advance.	

ADVERTISING.

Rates given on application.

All communications should be addressed to the Cleveland office,

THE MARINE RECORD PUBLISHING CO.,

Western Reserve Building, Cleveland, O.

Entered at Cleveland Postoffice as second-class mail matter.

No attention is paid to anonymous communications, but the wishes of contributors as to the use of their names will be scrupulously regarded.

CLEVELAND, O., AUGUST 15, 1901.

THE American Manufacturing Co. Wall St., New York, have just issued the second edition of a "Blue Book" on rope transmission.

THERE is no compulsion about the matter, but if any outsider has a few loose bags of \$s he can have it managed by some of the many shipowning experts on lakes or coast.

ALL fighters indulge in the vain propensity of talking too much, "Fighting Bob" included. Even a parrot lost its tail feathers once by talking too d—d much. There is much of a muchness among many, if not all of us.

THE Toronto yacht Invader walked away with the Canada cup on Wednesday in winning three races out of four, sailed off Chicago. Canadian yachtsmen first won the cup, it was afterwards retaken, but it is now back in the hands of its original winners. All honor to our cousinly yachtsmen.

Now that Canada has subsidized a French-Canadian steamship line to make bi-monthly trips between Montreal, Quebec and French ports, an excess of commerce can be looked for through the St. Lawrence system of canals. It is safe to say that no unbroken cargoes will cross the Atlantic for delivery at lake ports.

LAKE shipyards are not falling into decay on account of the lack of contracts for the construction of governmental tonnage. While it would be only right and proper to admit lake competition in the bids for naval and departmental bottoms, shipbuilders are doing fairly well on contracts for private owners just now, thank you.

WHILE the Dominion of Canada is wrestling with the problem of maintaining a safe western seaport, and calculating the ultimate success of such, as between St. John, Halifax, Quebec or Montreal, our more persevering talent, wealth and commercialism, dubbed Chicago, Ill., as not being too far west. Well! the presumption was mighty harmful.

THE types of vessel, purchase prices, refitting charges, etc., of the bottoms secured by the War Department for transport and dispatch service, raised a feeling among the people that their money was being played ducks and drakes with by highclassined incompetents in the service. The disposal of these converted craft is being equally dealt with and in a very suspiciously sub rosa sort of a way. We would like to know why adequate notice was not given out regarding the sale by auction of the late army transports McPherson and Terry, at the Morse Iron Works, New York, on August 5, and if other appraisals are to be dealt with along similar lines.

LAKE SHIPBUILDING.

With an aggregation of twenty-five large steel steamers to be built and equipped to the highest class known to modern usage, the several yards controlled by the American Ship Building Co. will place on the lakes next year a fleet of cargo and passenger steamers second to none in the world for the trade for which they are designed.

While a number of the boats will be duplicates, or sister ships, each successive construction points out methods and means of economy in the building, equipment and handling which is duly taken advantage of for the benefit of all concerned, and in no direction is this feature so pronounced as in the process of a standardization of all parts entering into the construction, and a mechanical unification of the more important branches of equipment, such as engines, boilers, propeller wheels, electric light installations, etc., etc.

The singular advantages, if such they may be termed, enjoyed by the lake trade, rests chiefly in the handling of bulk cargoes, such as ore, coal and grain, also in a measure lumber. The steamers and tow barges are simply and essentially cargo carriers, and, we were about to add, nothing else. The entire main deck spaced with hatchways made suitable to adjust iron ore chutes, coal tips and the legs of grain elevators, according to the structures on shore, it only becomes necessary to place the vessels in position, and then loading or discharging is accomplished in an almost automatic manner, or more distinctly by the aid of mechanical inventions known to the lake trade alone, or at least, in particular.

The form and dimensions of hulls, propulsive power and equipment is no longer a question, in so far as the lake trade is concerned, so that it may be said we have about arrived at the acme of economy in transporting water-borne commerce, notwithstanding all interests are willing and eager to advance, encourage and adopt any further advantages in any direction, the merits of which are outside the bounds of experimentation and the value of which may be demonstrable, regardless of time, labor or expense.

While the large organization known as the American Ship Building Co. takes precedence in the shipbuilding industry of the lakes, and, by this we include the finished production from keel to truck, for which their yards are planned and fitted, from end to end on the lakes, there are also minor industries the excellence of whose works is known far and near, and notably at the present time, are those of the Craig Ship Building Co., Toledo, and the Jenks Ship Building Co. at Port Huron. Unlike foreign shipbuilders, lake shipyards complete their construction, inasmuch as the engines and boilers, with other auxiliary appliances, are made on the spot, thus facilitating the delivery of the ship or vessel in its completed form and ready for immediate service at the moment of leaving the hands of the hull constructors.

Having and enjoying the foregoing advantages, it is not to be wondered at that lake shipbuilders and those in whose hands the general commerce of the lakes is effectually guarded, should consider that their lines of industry and business stands prominently to the front in the world's industry, and more markedly so in the interstate commerce of the United States.

AMERICAN MERCHANT SEAMEN.

The era is fast approaching when the United States will command a merchant marine somewhat in consonance with her position among the family of maritime nations.

The fiat has gone forth and every interested citizen most willingly awaits even the partial accomplishment of the much desired inevitable result of awakened interest on this important and eventually vital departure.

Arrays of dry statistical data, spasmodic individual attempts, and inspiring, though sometimes gushy and frothy utterances are no longer held in the balance. The fact is widely recognized that we are now up against a practical national condition of affairs which ought no longer to be permitted to exist. The United States demands that its over-sea water-borne commerce be carried under her own flag, and that argues for floating territorial space to be managed by the most talented skill upon earth.

The foregoing is but a prelude to the plea for a means of supplying this native professionalism at the country's command. There is ample evidence before us to prove that the national service, by which we mean the navy, has, by a series of well advised measures and vigorous, energetic action, taken this matter in hand, so as to provide and maintain a reserve force to draw from in time of requirement, or ordinary necessity, according to the increase and importance

of its standing, but no adequate notice has been taken of the bone and sinew, skill and talent absolutely required to successfully conduct a merchant navy, upon which so much of the future advancement of the country depends.

It goes without saying, that men without ships for them to man is to advocate the adoption of a useless appendage, but, the reverse of the situation, viz., ships without men, is a much more deplorable and humiliating spectacle, and that we will soon have the ships is, we assume, a foregone conclusion. There is an intense feeling of satisfaction in the fact that when a necessity arises the United States is always ready with an alternative, the demand is met and the break bridged over. This national feature is not always brought about by what may be called an immediate, spontaneous combination of action and devices. The probable or possible results of certain changes and innovations have not unfrequently been foreshadowed and in a measure provided for, hence, the fittingly results accomplished. It now behooves our legislators to lay the ground work for an adequate supply of seamen for the United States merchant navy, as symbolized by the forthcoming importance of our mercantile marine. In the words of the originator of the classical phrase, it will soon be found that we are to face "a condition not a theory," and, if such be assumed as an immediate one, we can not too soon make arrangements whereby American ships can be manned by native seamen, of which we have such a horribly sparse representation on the oceans of the world to-day.

AN echo of the Schley-Sampson naval court of inquiry is found in the following order. Comdr. William Swift, commanding the U. S. S. Yorktown, has been ordered to proceed with his vessel from Kobe, Japan, to Guam and there relieve Comdr. Seaton Schroeder as naval Governor of the Island of Guam. The latter officer will proceed to Japan; and from there take steamer to the United States for the purpose of being present at the court of inquiry which has been called to investigate the conduct of Rear Admiral Schley. The general opinion among taxpayers in this vicinity appears to be that the Secretary of the Navy ought to give this foolish row its quietus, at least until Congress meets. The Secretary of the Navy ought to realize that the sun does not rise, shine and set exclusively for the bleaching out of naval officers' twaddles. Whether Schley downs Sampson, or Sampson overcomes Schley, not the value of an ear of corn will be added to the productiveness of the country, whichever way it goes, but it will cost millions to say so officially. The whole mess smacks of the idiotic action of searching for a needle in a hay stack by starlight.

THE Bureau of Equipment has just had printed some special star charts for use in navigation. The history of these charts is interesting. The story, as told by the Army and Navy Journal, is as follows: Mary Proctor, the astronomer, daughter of the great English astronomer, took to the publisher, W. B. Harrison, of New York, a plan for a child's calendar (astronomical), and together they worked over the plan until finally Mr. Harrison said: "Why cannot we make a simple star chart for children—not one cluttered up with stars invisible almost, but one containing only the more prominent ones? And why cannot we make these charts so that the stars visible at any time during the year may be easily found by a child?" After a number of months the chart was worked out simply enough to suit, and it is this chart, so simple that a child of eight can use it, which the Department has selected for use for navigation. It is published with a star finder, and pad of map blanks that a series of separate maps may be made, for it is more convenient to carry an enlarged map on paper than the chart, which cannot be folded.

IT was a foregone conclusion that Lloyd's Register, London, would find it necessary to send an extra and more energetic representation to this side of the pond. It is therefore heralded that Mr. Thomas Congdon, principal surveyor in the United States to Lloyd's Register of British and Foreign Shipping, will retire from active service (nearly forty-six years, twenty years of which in the United States as surveyor to the above named society) at the end of the present month. Mr. George Stanbury, London, has been appointed Mr. Congdon's successor. In line with this departure it is learned that the Committee of the British Corporation for the Survey and Registry of Shipping have recently made the following appointments of non-exclusive surveyors at the ports named—Boston, Mass., Charles Skentelbery; Sault Ste. Marie, Ontario, George T. Clift.

A MORE or less esteemed contemporary is quoted as saying, in reference to the recent opening of the St. Lawrence system of canals, "since then the Northwestern Steamship Company, of Chicago, has opened a regular service on this route, and its four steamships, built at Chicago last winter, have each made a trip. The company expresses itself as satisfied with the results of the enterprise." It seems too crude to state that since the above assertion was printed and sent out broadcast, the regular (?) service has been discontinued, and the company expresses itself as being completely checkmated in its original notional adventure and the results of their mistaken enterprise.

WHILE all possible efforts are being turned towards using every means towards advancing the speed of vessels, a Swedish count is exercising his ingenuity in perfecting a device for retarding the speed and stopping vessels suddenly. The latter idea is a very old one, this office alone having turned down two or three of the same nature within the past few years. Vessels have a failing of stopping unexpectedly sudden at times when it is desired to keep them waterborne; however, the Swedish notion may prevail in special cases, under certain conditions, at some hazy time in the dim and distant future. It is not a practical patent to bank on just now.

THE British cruisers Minerva and Hyacinth, the first fitted with Scotch boilers, and the latter with the Belleville water tube type (the same as the North West and North Land, in lake service), have just completed a trial trip for testing boilers, to and from Gibraltar. The Minerva arrived first at her destination and the Hyacinth reported the severe scalding of a stoker by the bursting of one of the Belleville tubes.

ONE of the finest and best land locked harbors in the world is found in Bantry Bay at the southwest extremity of Ireland, Berehaven is quite a little town there, and it is now proposed to construct harbor works and transform Berehaven into an eastern terminus for the Atlantic passenger traffic. This is a step in the right direction and leaves a choice as between Queenstown and Berehaven.

SIBBICK, of Ryde, Isle of Wight, England, designed the Invader; her crew took all out of her that was to be had, with the result that the yachting trophy of the lakes is now held by Canadian boat sailors. This is a precedent, or is it a precursor for the Dennys, of Dumbarton, builders of Shamrock II? The Invader's crew were skillful, how are the Shamrock's?

AGAIN is the Lake Carriers' Association compelled to take "the bull by the horns" and furnish another light-ship for the safety of the general commerce of Lake Erie. This aid to navigation is required in a Canadian channel, but chiefly for the use of American traffic, hence, the authorized action of a semi-private corporation.

LAKE FREIGHTS.

Iron ore rates remain stationary with perhaps a shade less of eagerness to rush ore down the lakes, or, which is much the same thing, a trifle more detention is being felt, chiefly at discharging points, so that last month's movement record will hardly be paralleled. Escanaba cargoes are light: Marquette, 70 cents, and the head of the lakes, 80 cents.

Coal freights are steady at last week's advance to Lake Michigan from Buffalo, remaining at 40 cents from Ohio ports and 35 cents to the head of the lakes as the Lake Erie figure.

Grain rates have been nominal all week; first 1 cent was offered on corn, then 1½ cents, 1 cent for oats, and 1¼ cents on wheat, Chicago to Lake Erie ports. These are now the quoted figures, with light shipments. The Duluth grain movement is being carefully watched, but there is a lot of tonnage chartered ahead at a 3 cent rate.

Lumber shows no change from the \$2.50 rate, Lake Superior to Lake Erie ports. A \$2.00 rate has been paid, Ludington to Buffalo.

THE drainage of the Zuyder Zee is again proposed in the Holland States General. This sheet of water does more harm than good to Holland; and a dyke at the northern end would add 500,000 acres of fertile land to the State. It is estimated that this sea could be drained in about eighteen years, at a cost of about £7,600,000; the land reclaimed would be worth £32,000,000. Included in the above cost is the sum of nearly £400,000 to be paid as an indemnity to Zuyder Zee fishermen.

LAKE SHIPBUILDING CONTRACTS.

The American Ship Building Co. closed a contract this week for the construction of five large steel cargo steamers to be built to the order of the National Transportation Co., Capt. W. W. Brown, Cleveland, General Manager.

As the ways at the several yards of the American Ship Building Co. were under contract for tonnage for delivery next spring, the Mutual Steamship Co. waived their rights to the delivery of three boats, thus permitting the builders to close the order with the new company for five boats in all, making a total of 23 steamers now under contract at the yards of the American Ship Building Co.

Two of the steamers are to be of the following general hull dimensions: 346 feet keel, 48 feet beam and 28 feet molded depth, to carry 4,800 tons; one 370 feet keel with the same beam and depth, to carry 5,200 tons; one 380 feet keel, 50 feet beam and 28 feet molded depth, to carry 5,500 tons, and one 414 feet keel of the same beam and depth, having a capacity of 6,200 tons.

The Craig Ship Building Co., Toledo, Ohio, will build a steel steamer for the Pacific coast lumber trade to the order of Messrs. Swayne & Hoyt, San Francisco, for delivery early next year. Her general hull dimensions will be 180 feet in length and 36 feet beam, to carry 800,000 feet of lumber.

MILWAUKEE HARBOR IMPROVEMENTS.

Decisive steps were taken toward the improvement of Milwaukee harbor at the special meeting of the council held this week. The ordinance for the issuance of \$100,000 bridge bonds was introduced and referred. A resolution was introduced to replace the West Water street bridge with a bascule structure, and was referred. A recommendation from the mayor for a special committee of three to confer with the Milwaukee road officials regarding the replacing their bridge with a bascule bridge was referred to the committee on judiciary.

LETTERS AT DETROIT MARINE POST OFFICE

To get any of these letters, addressees or their authorized agents will apply at the general delivery window or write to the postmaster at Detroit, calling for "advertised" matter, giving the date of this list and paying one cent.

Advertised matter is previously held one week awaiting delivery. It is held two weeks before it goes to the Dead Letter Office at Washington, D. C.

Austry, Ed. H., Maytham	King, Chas., Marquette
Allen, Sandy, Queen City	Laffery, Delos, Haywood
Aikman, Jas. T.	Labea, Fred., Palmer
Aldrich, Bert.	Laurenscha, Adam, Harper
Baker, Fred. L.	Misner, Henry, Manola
Bell, Archie L., 2, Neilson	Mullaly, John
Brown, D. D., 2, Manola	Miller, Frank, Italia
Brown, Frank, Sagamore	Martin, Nelson, Colgate
Beck, Robt.	McLeod, H. L., Pratt
Clark, F.	McCrae, Ken., Oglebay
Catsell, Walter	McCool, J. B.
Cadotte, F. A.	McGuffin, James
Cran, Geo. M., 2	McCallum, Dan
Dunn, Frank, Penobscot	McKinnon, Hugh
DeChamplain, A., 134	Nelson, Chris., Nyanza
Danney, Chas., Tuscarora	O'Brien, Dan, Italia
Elliott, Joe C., LaSalle	Ostrander, Durward
Estell, Capt. H., Martini	Patrick, Frank, 2, LaSalle
Elliott, Thos.	Pearse, Forest, Tampa
Floyd, Edw., Pope	Rourke, Tom, Oades
Fowler, Delois	Ross, Wm. S., Judd
Fiebach, Phil., Bunsen	Stone, Edw.
Francombe, Thos.	Sauvey, J., Antrim
Graham, Wm. S.	Spaulding, J. M., Stevenson
Goodwin, C. L., Pathfinder	Smith, Berley, Sagamore
Greenway, Bert, Wilhelm	Sharp, W. M.
Heythaler, Louis, Drake	Sheppard, Chas. A.
Hefferman, Thos.	Sauve, Ben., Tyrone
Swain, Harry D.	Schaefer, J. T., Siemens
Judson, Ed., Minnesota	Thurd, James B., Nimick
Joiner, Capt. E. C., Sagamore	Tomsen, Tom, Tampa
Kass, Herman	Wilson, John, Maytham
Kinney, A. E., Italia	Walters, Fred., H. H. Brown
Keyser, Anthony, Nyanza	Woodrow, Geo. S., Roby

CONSUL LISTOE, writes from Rotterdam, May 17, 1901: Chicago as a seaport commences to attract the attention of Europe. A Rotterdam ship-broker firm advertises in the local papers, for the first time in maritime history, that it will accept freight to go through with bulk unbroken to Chicago. It is now almost needless to observe that this advertisement ought to have been marked, t. f. which in printers' parlance signifies, till forbid, a state of affairs which now may be said to exist regarding unbroken cargo through to Chicago. The consul was not punning when he mentioned that the freight would go through in bulk unbroken the owners of the vessel would look after that part of it on delivery of the cargo.

A CHICAGO FAILURE.

In announcing the failure as a commercial enterprise of the attempt to make Chicago an ocean port, the press of that city is laying more on the disadvantages of the St. Lawrence route than the facts justify. The insurance rates on the vessels that ran from Chicago to Europe and return, as is pointed out, were high; they are high on all vessels using the St. Lawrence, and events of this season have done something to support the course of those who fix them. They do not, however, keep ships from coming to the port of Montreal in such number that its tonnage shows a steady increase for any given period of years that may be taken. "The frequent storms, dense fogs, changing currents and rugged coast" that one Chicago journal refers to as St. Lawrence drawbacks, did not cause any more risk to the Chicago-bound steamers than they do to those that for years have been profitably using the St. Lawrence, which are using it now, and which will, no doubt, profitably use it for years to come, in face of the same insurance rates that the Chicago shippers paid. The causes behind the failure of the Chicago enterprise, if it has finally failed, were foreseen from the beginning, and have been frequently discussed by marine experts. They are in a way akin to those which cause the ocean steamship to come as far inland with and for its cargoes as it can get. The Chicago vessels were limited in capacity by the size of the locks through which they had to pass between their port of departure and ocean navigation. They could, above Montreal, only load to fourteen feet, and their draft below was, in consequence, restricted to about 18 feet. Vessels of such capacity have been in effect driven out of the St. Lawrence trade by the competition of ships of three or four times their size, drawing, when loaded, from 25 feet up. The case was like that of a railway with 30-ton engines drawing 14 to 18 cars as a load trying to compete with a road whose equipment of 90-ton locomotives drew forty and fifty cars at a load. That ships could use the route from Chicago to the ocean and return, it did not need this season's experiment to demonstrate. That there would be profit in carrying freight by them was not believed by those who had studied the situation in knowledge of all the facts. The unsatisfactory voyages only show that the promoters of the Chicago enterprise had courage beyond their discretion. It did not condemn the St. Lawrence route.—The Gazette, Montreal.

NOTES.

JOHN GREEN, Green Bay, has been awarded the contract for the new breakwater for the Chicago & Northwestern railroad at Sheboygan, Wis. The new structure will extend 1,200 feet south from the south pier. The railroad company is doing the work for protection of its own property.

CONSUL-GENERAL TURNER, reports from Ottawa, May 23, 1901, that Parliament has ordered a bounty on pig lead manufactured in Canada—\$5 to be paid per ton for the first year, \$4 for the second year, \$3 for the third year, and thereafter \$2 per ton for fifteen years; the amount of bounty not to exceed \$100,000 for any one year.

TURBINE engines for large vessels are proving a success, and advices from Glasgow state that the steamer Kin, Edward, which was built by Denny Bros., Dumbarton and which is fitted with turbine engines, on an official trial on the Clyde maintained a uniform speed of twenty knots an hour for three hours. There was almost no vibration.

ACCORDING to the Crown Lands Department, Canada, important discoveries of iron have been made to the east of Lake Nipigon, in Thunder Bay district. The American Steel Co. has applied for 8,000 acres of mineral lands, and the Algoma Commercial Co., one of Mr. Clergue's corporations, has options on 4,000 or 5,000 acres. There are two parallel ranges running from the shore of the lake ten miles eastward. The ore is low grade hematite of about 40 per cent. purity.

THE keel of the armored cruiser Pennsylvania was laid at the Cramps' shipyard, Philadelphia, Pa., last week. This is the first of the new vessels, for the construction of which contracts were lately let, to be laid down. A sister ship to the Pennsylvania, the armored cruiser Colorado, will be started later by the Cramps. Both vessels are armored cruisers. The general dimensions are: Length on the water line, 502 ft.; extreme beam, 69 ft. 6 in., and mean draught 24 ft. 6 in. The displacement is 13,680 tons. The cruisers will have twin screws, triple expansion vertical engines, and water tube boilers of the Niclausse type. The engines are designed to develop 23,000 H. P., producing a speed of 22 knots an hour.



A TRUSCOTT BOAT

SIMPLE, SAFE,
RELIABLE, SPEEDY.

It may be possible to build better and safer boats, but it hasn't been done yet.

We send a completely illustrated catalogue and price list free, which tells you all about boats and

WHY TRUSCOTT BOATS EXCEL.

Truscott Boat Mfg. Co.,
ST. JOSEPH, MICH.

Pintsch Gas Lighted Buoys.

Adopted by the English, German, French, Russian, Italian and United States Light-House Departments for channel and harbor lighting. Over 1,000 gas buoys and gas beacons in service.

Burn Continuously

from 80 to 365 days and nights without attention, and can be seen a distance of six miles.

Controlled by

THE SAFETY CAR HEATING AND LIGHTING CO.

160 Broadway, New York City.

THE GEORGIAN BAY.

To one who has lived the best years of his life on the shore of Georgian Bay, the task of writing a short sketch of this great arm of a still greater lake is a pleasure rather than a labor. No one can live beside a vast body of water and see it in all its varying moods, under all kinds of conditions, without learning to love it and watch its every change. The French discovered Georgian Bay early in the seventeenth century. Canadians, by thousands, are now "discovering" it anew.

Before America was ever dreamed of, and before Columbus was born, the shores of Georgian Bay were peopled by a savage race, whose chief desire in life would seem to have been the destruction of each other. The history of the tribes that lived and disappeared has never been written, but traditions that have been handed down from tribe to tribe tell of many and wonderful doings, and which, were they printed, would sound more marvellous than the works of fiction. These were the people whose descendants we call Indians, but who were called, in the Ojibway tongue, Nishanahbay.

When the French explorers first visited Georgian Bay, about 1620, they found the south shore peopled by a nation—the Hurons—of an industrial and peaceful disposition dwelling in villages, and cultivating the soil; the whole numbering between 20,000 and 30,000 souls. On the southeast shore was a tribe kindred to the Tobacco nation, whose territory adjoined that of the Hurons, between Georgian Bay and Lake Simcoe. On the north shore and along the French River, Lake Nipissing and the upper Ottawa, dwelt the tribes of the great Algonquin nation—the Ojibeways, the Pottawattamies, the Nipissingans, the Mississaugas and the Ottawas, while away to the west were the Saultaux and other branches of the same family, and kindred tribes.

How the fierce and crafty Iroquois—Six Nation Indians—almost utterly exterminated the Hurons and broke up the Jesuits' mission, is duly and graphically told by Parkman, the historian, with whose works every Canadian ought to be familiar. After the extermination of the Hurons the Jesuit mission ceased, and so for the next hundred and seven years there is no written history of the Georgian Bay country. Of the great war which followed between the victorious Iroquois and the Ojibeways, there is nothing but Indian tradition.

The English visited Georgian Bay the latter part of the eighteenth century, but it was not until the early part of the nineteenth century that its exploration was begun in earnest. It was then found that the bay was in reality an arm of Lake Huron—a fact which the French must surely have known. The larger lake was allowed to retain the name of Huron, after the exterminated nation, the bay being named "Georgian," in honor of King George the Third.

The first settlement on the bay was undoubtedly at Penetanguishene, where the Jesuit fathers gave their lives for their flocks in the days of the massacre. Early in the forties of the present century, Scotch pioneers made their way to Sydenham—now Owen Sound. The projection of the Northern railway made the settlement of Collingwood—hitherto a mere fishing station—a possibility. Other towns and villages grew in due course. The early navi-

gation of the bay would fill a chapter in itself. After the bark canoe of the native, the Mackinaw sail-boat held the lead for many years, and many wonderful stories could be told of adventures in calm and storm. Next, small steamboats and schooners put in an appearance, and did the carrying trade between Owen Sound and Collingwood. Now the steamers plying upon the bosom of the Georgian are the largest and staunchest on Canadian fresh water.

The whole of the east and north shores are lined with islands, extending from a mile or two, in many places, to from twenty to twenty-five miles out in the bay from the main shore. These islands are of almost every imaginable area, from the Grand Manitoulin to the size of an ordinary packing-case. Bayfield, in his chart of the bay, accurately located fully 33,000 islands, and there are probably fully as many more that he did not discover, not having time to penetrate the vast archipelago. Wonderful as it may seem, additional islands are coming to the surface almost annually, through the gradual recession of the waters, which is so marked a phenomenon of the entire lake system.

The Thousand Islands of the St. Lawrence fade into insignificance when contrasted with the almost countless multitude of Georgian Bay. So great is the range of islands that a canoe voyage might be taken from Penetanguishene to Sault Ste. Marie, a distance of over four hundred miles, without seeing the open waters of the bay more than half a dozen times.—Toronto Saturday Night.

FRENCH-CANADIAN STEAMSHIP LINE.

Consul-General Turner, of Ottawa, informs the Department that the Canadian Government has signed a contract with the Franco-Canadian Steamship Company for the establishment by the latter of a steamship service between Dominion and French ports. The contract is to run for a year from the 1st of July, 1901. In summer, fortnightly trips will be made from Montreal and Quebec, and in winter monthly trips from St. John and Halifax. The contract is based upon a tonnage rate per voyage; and on an estimate of eighteen trips, the company would earn \$50,000 the first year.

The consul-general adds that as there is a subsidy of \$100,000 available, there is some talk of the company increasing the number of steamers, so as to give a weekly service during the summer.

EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, report the condition of the Eastern freight market as follows:

Chartering in all directions continues on a very limited scale owing to the scarcity of orders. Grain shippers have still to contend against the continued high price of cereals and as long as shippers and buyers are as far apart in prices as at present, we fear there is little chance of any activity in grain chartering. Steamers have been obliged to find employment in various other trades, principally for phosphate, timber and deals but even in these cases, owners have had to concede reductions in order to secure business. Altogether the situation is anything but encouraging.

In regard to sail tonnage we can only note that the market continues apparently steady, with but small inquiry and very little business accomplished. An occasional change in rates has been in favor of shippers.

GRAIN OUTLOOK AT DULUTH.

There is now every indication of the heaviest grain shipments for the balance of the season from the head of the lakes. The Duluth Daily Commercial Review says:

"The members of the Duluth Board of Trade, the Duluth banks and grain elevators at the head of the lakes are preparing to handle, finance and warehouse what promises to be the banner grain crop of the Northwest. The ability of these institutions to do this cannot be questioned. They constitute a market that cannot be surpassed anywhere in the world. The terminal system here is practically perfect. The elevator capacity has been largely increased, and all the houses represent the latest practice in the handling and storing of grain and the lowest charges in the world. The receiving commission houses at the head of the lakes are better equipped than ever for serving the Western trade, and the commission charged is lower than that prevailing in any other market in this country. The shipping houses have enlarged their connections both at home and abroad, and the Western shipper is assured a market at Duluth that is world-wide."

"There is a demand here for wheat of all grades, and the competition among the local buyers will be keener than ever. Several new flax buyers have established offices on the Duluth board, which will broaden materially the market for this seed. One, and probably two, new barley concerns will be established. It is certain that the old contest between Duluth and Chicago on corn and oats will be maintained."

"The transportation facilities in and out of Duluth are unsurpassed. The equipment of the four grain receiving roads has been enlarged very materially, and the grain is moved east via the different lake routes at rates that are remarkably low."

"And a further and most important consideration rests in the fact that we are assured this year of an inspection that will guarantee the integrity of the grain."

"The trade here extends greeting to the grain growers of the Northwest, feeling assured that the numerous advantages of this market are thoroughly appreciated, and the good fellowship now existing will be stimulated and strengthened hereafter."

EXPOSITION OF FISHERIES AT ST. PETERSBURG.

Consul-General Guenther sends the following from Frankfort:

The Imperial Russian Association of Fisheries will hold an international exposition in February and March, 1902, at St. Petersburg, for the purpose of showing the condition of the fresh and salt water fisheries of the world. The expense of the exposition will be defrayed by the association, the Crown, the municipal government, private contributions, and by charges for exhibition space and for the admission of visitors. Premiums will be awarded in the form of gold, silver and bronze medals, diplomas of honor, and money prizes. The exposition will have nine departments, as follows: (1) Fisheries in general; (2) salt and fresh water fisheries; (3) implements used in the fisheries industry; (4) products of the fisheries; (5) manner and means for preserving fish; (6) arrangement of fish hatcheries; (7) fishing sport; (8) aquaria and their inmates; (9) scientific researches concerning the lives of fishes, etc.

RIGHT AND LEFT FOR STEERING TERMS.

CLEVELAND, O., Aug. 14, 1901.

To the Editor of the *Marine Record*:

As some of the governments of Europe are considering the abolition of the phrases port and starboard because of their conflicting meanings which render them unfit words for the expression of orders to the man at the wheel, a few lines may not be out of place at this time, although you have kindly published for me more than one article on that subject during the past several years.

The words starboard and larboard, which are now changed to starboard and port, were first intended for the direction of the movements of the tiller, and as the necessities of the marine profession demands that the wheel must do when moved in a certain direction what the tiller would accomplish if moved in an opposite direction, it seems plain that we should use words suitable to the movements of the wheel and let the phrases starboard and port be used only where the tiller is still used directly. Some hold that the phrases have reference only to the movements of the vessels and not to the steering apparatus at all, to which I do not agree, and even if that were true I see no reason why the words right and left would not express one's meaning even more clearly than the phrases starboard and port.

The word starboard in one sense means the right hand side of the ship when standing aft and looking forward and of course the phrase port means the left hand side of the ship when standing aft and looking forward. In another sense the word starboard means anything, or rather anywhere to the right of anything anywhere in the ship, and it follows of course that the word or phrase port means anywhere to the left of anything or anywhere in the ship. Again, land on the right hand side of a ship is called the starboard shore if there is also land on the left hand side, and the land on the left hand side is called the port bank or shore, and yet to get to that port shore we must starboard, and according to our queer rules we must port if we wish to find the starboard shore. Others think that to fix the steering gear so that the movements of the wheel would correspond with the movements of the tiller when the orders port or starboard is given would settle the whole cross-eyed business, but they too are mistaken. If that were the case in a sailing ship a man could not stand at the weather side of his wheel because the strain of the weather-helm would lift him off the deck and throw him over the lee rail, whereas if he stood on the lee, where the pressure would be downward as it should, he could not see ahead on account of the fore and aft sails bellying on that side. During my fifteen years experience as a seaman I have seen at least two collisions caused directly by mistakes in giving orders as well as receiving orders in the old way of wording the orders. In close quarters when men lose their nerve, if every word does not mean just what it says, there is apt to be mistakes, and in my opinion the words left and right should be adopted as the standard words for the direction of the movement of the wheel. It would cause no expense nor necessitate any international law, the old could understand it as well as the lad just beginning, and although it would seem at first a little landlubberly we would soon get used to it and wonder that we did not adopt it long ago.

When the order, the man at the wheel, the rudder, and the ship's head goes together the system will be perfect and this is exactly the condition that will prevail when starboard and port are abolished and the true language adopted in their stead.

PATRICK CAROLAN.

SHIP CANALS OF RUSSIA.

The proposed ship canal between St. Petersburg and the White Sea, engineering plans of which have been approved by the Minister of Communication, is to be commenced during the present year. In brief, the plans are as follows: The naval port Cronstadt (the entrance to St. Petersburg) is to be connected with the new naval harbor Scrotskaja, on the White Sea, by a canal of sufficient breadth and depth to admit the passage of Russia's largest cruisers. The extreme depth will be 31 feet, while the water surface will have a breadth of 200 feet. The length of the canal will be 963 kilometers, and it will pursue the following course: From the River Neva to Lake Ladoga; across the lake to Svir River, and the entire length of this stream to Lake Onega; due north through a new canal to Sego Lake; again by canal to Vigozero Lake; and thence to the Gulf of Onega and White Sea.

This new waterway will not only have advantages from an industrial point of view, creating cheap transportation for timber and grain from the provinces of Archangel and Olonetz, and causing the establishment of saw and grain mills along its course, but is of most importance in its strategic value—placing the Baltic and White Sea divisions in direct communication on their own soil.

With the merchant marine of Russia, her contemplated canals, her finished trans-Siberian railroad, and her total independence of any foreign steamer, cable, telegraph, or rail, from the Baltic Sea to the North Pacific Ocean, one has a view of possibilities equally as great in peace as in war.

DUST IN EARTH'S ATMOSPHERE.

It has often been wondered how dust collected each day on board of a sailing ship months after she had left port. The subject puzzled Capt. Cook one of the earliest navigators, later investigations, however, seem to account very naturally for the apparently miraculous condition.

Baron Nordenskjold, upon finding on the snows of Greenland dust composed of the elements invariably associated meteorites, and of uncommon occurrence in terrestrial matter, concluded that cosmic dust is falling imperceptibly but continually upon the earth. Recent spectroscopic examination of many varieties of dust collected in England and elsewhere has an interesting bearing on Nordenskjold's conclusions. Among the constituents of dust floating in the air are lead, silver, copper, rubidium, gallium, indium, thallium, nickel, manganese, and so forth. Many of these can be traced to their sources in factory chimneys and flues. Volcanic dust has characteristic features, and dust from clouds, collected either by itself or in hail, snow, sleet or rain, exhibits a regularity of composition not seen in other varieties of dust. Iron, nickel, calcium, copper, potassium and sodium always appear in it in about the same proportions. Some dust that fell near Dublin in 1897 resembles meteorites in its composition, is attracted by a magnet, and seems to be of cosmic origin.—Science.

THE Smithsonian Institution was founded by James Smithson, an Englishman, who left his estate, valued at \$550,000, to the United States Government to establish in Washington an institution "for the increase and diffusion of knowledge." The Congress of the United States has placed the following Bureaus of the Government under the direction of the Smithsonian Institute: The United States National Museum, the Bureau of International Exchanges, the Bureau of American Ethnology, the National Zoological Park and the Astrophysical Observatory.

SUN'S AMPLITUDES.

The following approximate amplitudes of the Sun's rising or setting will be given each week in this column during the season of navigation. A second bearing may be taken by compass at sunset, by reversing the east bearing given for the nearest latitude, as the change in declination for a few hours makes but a slight difference in the true bearing of the Sun's setting. The bearing may be taken when the Sun's center is on the horizon, rising or setting. The elements which may be obtained by taking these amplitudes are the quantities known as local attraction, variation and deviation, or the total difference between compass and true, or geographical bearings.

LAKE ERIE AND S. END LAKE MICHIGAN, LAT. 42° N.

Date. Amplitude. Bearing P'ts. Bearing Comp.
Aug. 16.... E. 19° N. = N. 6 1/4 E. = E. by N. 3/4 N.
Aug. 19.... E. 18° N. = N. 6 3/8 E. = E. by N. 5/8 N.
Aug. 22.... E. 16° N. = N. 6 1/2 E. = E. by N. 1/2 N.

LAKE ONTARIO, S. END HURON AND CENTRAL PORTION LAKE MICHIGAN, LAT. 44° N.

Date. Amplitude. Bearing P'ts. Bearing Comp.
Aug. 16.... E. 20° N. = N. 6 1/4 E. = E. by N. 3/4 N.
Aug. 19.... E. 18° N. = N. 6 3/8 E. = E. by N. 5/8 N.
Aug. 22.... E. 17° N. = N. 6 1/2 E. = E. by N. 1/2 N.

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.

Date. Amplitude. Bearing P'ts. Bearing Comp.
Aug. 16.... E. 20° N. = N. 6 1/4 E. = E. by N. 3/4 N.
Aug. 19.... E. 19° N. = N. 6 3/8 N. = E. by N. 5/8 N.
Aug. 22.... E. 17° N. = N. 6 1/2 E. = E. by N. 1/2 N.

LAKE SUPERIOR, LAT. 48° N.

Date. Amplitude. Bearing P'ts. Bearing Comp.
Aug. 16.... E. 21° N. = N. 6 1/4 E. = E. by N. 3/8 N.
Aug. 19.... E. 20° N. = N. 6 1/4 E. = E. by N. 3/4 N.
Aug. 22.... E. 18° N. = N. 6 3/8 E. = E. by N. 5/8 N.

With a compass correct magnetic, the difference between the observed and true bearing or amplitude will be the variation for the locality. Should there be any deviation on the course the vessel is heading at the time of taking the bearing, the difference between the observed and the true amplitude after the variation is applied will be the amount of deviation on that course. If the correct magnetic bearing is to the right of the compass bearing, the deviation is easterly, if to the left, the deviation is westerly.

A RECENT order issued by the Navy Department states that hereafter the naval station at Bremerton, Wash., shall be known as the "Navy Yard, Puget Sound." It is the intention of the Department to fit up this yard with necessary tools and machinery to carry on all of the repair work required by the largest ships, and the estimates for the next fiscal year, it is understood, will embrace liberal expenditures for the Puget Sound Navy Yard.



S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.
312 ATWATER STREET,
DETROIT, MICH.



THE
Bliss

LIQUID (Spirit)
COMPASS

Made in seven sizes by JOHN BLISS & CO., 128 Front Street, New York, is finely finished sensitive, accurate and durable. Moves quickly and is extremely steady. Is the best Liquid Compass ever made in this or any country. For sale by ship chandlers generally.



Steamboat Fuel at Chicago. YOUGHIOGHENY and LEHIGH COAL CO.

J. T. CONNERY, Manager. ARCHIE J. HITCHCOCK, Dock Supt.
MAIN OFFICE: 1238-1242 Chicago Stock Exchange Building.
Long Distance Telephone, Main 5049. 110 LA SALLE STREET.
No. 1, Michigan Slip and Basin. Phone 3046, Main.
No. 2, N. Halstead St. Bridge. Phone 773, North.

FUEL DOCKS:

Equipped with 125 2-ton Buckets for
Fueling anywhere in Harbor

FUEL LIGHTER:

WE PRODUCE OUR YOUGHIOGHENY COAL
AND GUARANTEE QUALITY.

PICKANDS, MATHER & CO.

PIG IRON.
IRON ORE AND COAL.

FUEL LIGHTERS

AT BUFFALO,
ERIE,
ASHTABULA,
AND CLEVELAND.

At DETOUR, MICH., A FUEL DOCK equipped with
Shute capacity of 600 Tons.
Best Quality PITTSBURGH COAL furnished at any
time during Day or Night.

WESTERN RESERVE BUILDING, CLEVELAND, O.

IN PRACTICAL USE ON THE BEST AND LARGEST LAKE STEAMERS

Using all Types of Boilers and all Pressures of Steam.

Every Purifier Warranted to Remove all Sediment or Scale-Forming Substance.

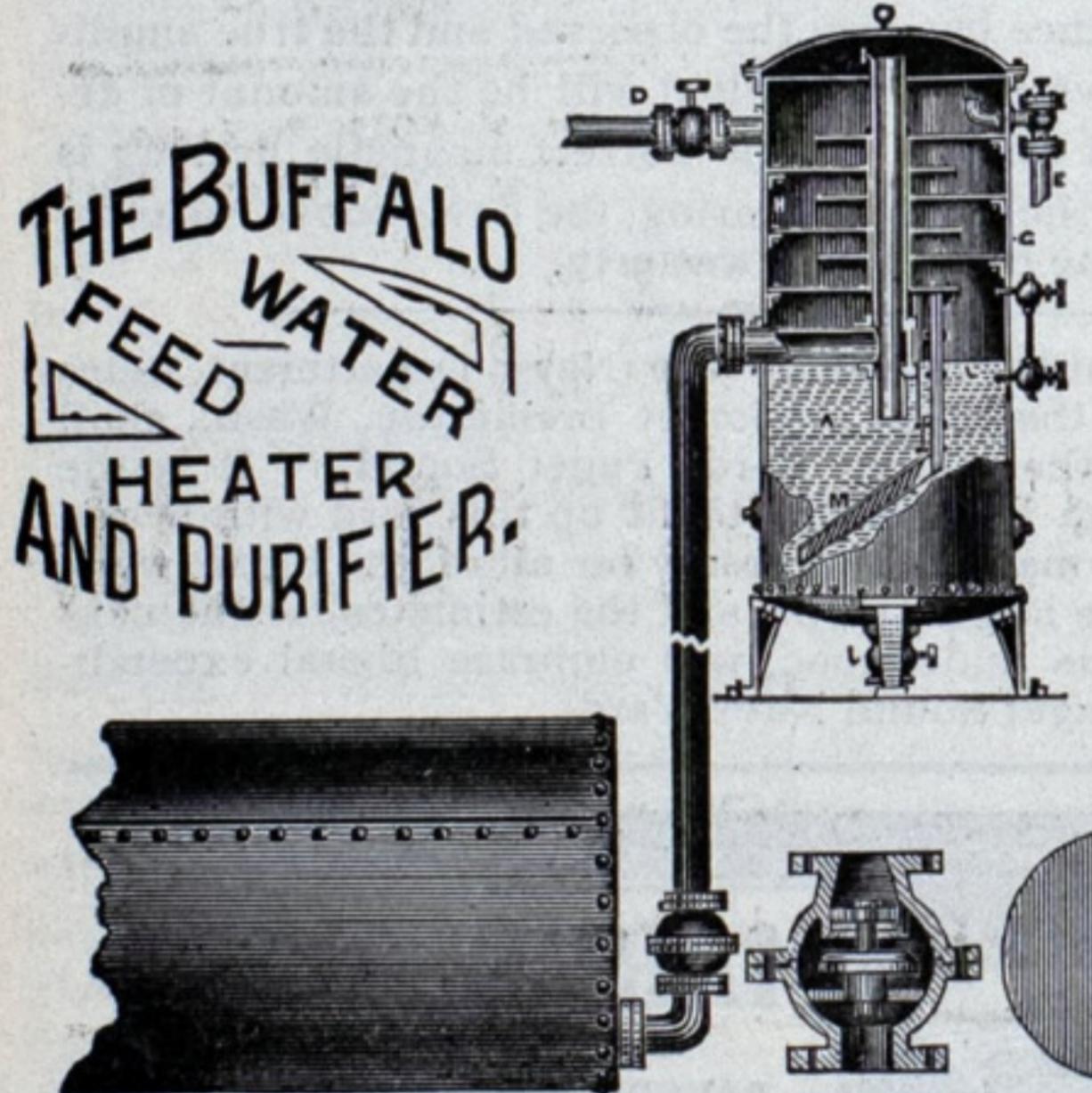
ROBERT LEARMONT, PATENTEE,

SEND FOR CIRCULAR.

100 WHITE BLDG., BUFFALO, N. Y.

NAMES OF STEAMERS ON THE LAKES USING THE BUFFALO FEED WATER HEATER AND PURIFIER:

Zenith Transit Co.'s steamers Empire City, Crescent City, Zenith City, Superior City, Queen City, Pennsylvania and John W. Gates. The Republic Iron Co.'s steamers America, Brazil, Thomas Maytham and Chili. Mitchell Transportation Co.'s steamer Hendrick S. Holden. Minnesota Iron Co.'s steamer Presque Isle. American Steel Barge Co.'s steamer Alex. McDougal. Lake Michigan & Lake Superior Transportation Co.'s steamer Manitou. Bessemer Steamship Co.'s steamers S. F. B. Morse and Douglas Houghton. American Transportation Co.'s steamers John Harper and Alex. Nimick. Red Star Line's steamers Robert Mills and Wyoming. Wilson Transit Line's steamers W. D. Rees and Andrew Carnegie. And the steamer William R. Linn.



Compass Adjusters.

Clarence E. Long,

MILWAUKEE, WIS.

Scientific Compass Adjuster.

Compass Compensation, Tables of Deviations and Residual Errors for Wooden, Iron and Steel Vessels by Azimuths of the Sun, Stars, Moon and other Planets.

SERVICE—DAY OR NIGHT.

All adjustments promptly and accurately executed. Estimates and Prices given upon application. All work guaranteed to be absolutely first-class.

Compasses Adjusted

For deviation, and deviation tables supplied. Great facilities for doing the work by day or night.

John Maurice.

CHICAGO.

Office, N. W. Cor. Randolph and Market Sts.
Residence, 1213 S. Albany Ave.
'Phone, Canal 767.

Edwards Marine Air Pump.

FOR LICENSE TO MANUFACTURE THESE WELL-KNOWN MARINE AIR PUMPS APPLY TO

WHEELER CONDENSER & ENGINEERING CO.

120 LIBERTY ST., NEW YORK.

SEND FOR PAMPHLET.

M. A. HANNA & CO.

COAL, IRON ORE AND PIG IRON.

Fuel scow with elevators and discharging spouts. Storage of 650 tons. Discharges 150 tons an hour into steamers while unloading cargo.

Steamboat Fuel at Ashtabula.

Large Supplies of Best Quality.

LIGHTER

carrying different grades
at all times.

MINERS AND SHIPPERS.

MAIN OFFICE, Perry-Payne Bldg., Cleveland, O.

THE W. L. SCOTT COMPANY

ERIE, PA.

WHOLESALE DEALERS IN

Shamokin-Wilkesbarre ANTHRACITE
Youghiogheny, Mansfield, PITTSBURG

COALS

VESSEL FUELING A SPECIALTY

by steam lighter or car dump
at all hours. Electric Light.

MAIN OFFICE:

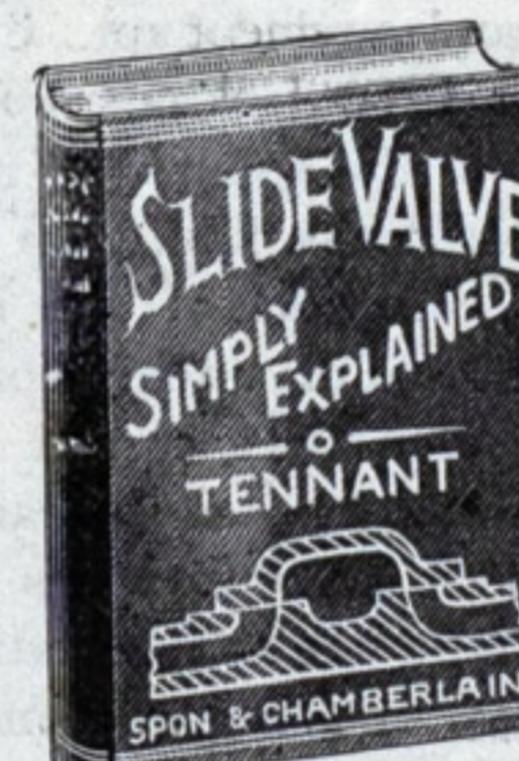
Scott Block. Long Distance 'Phone 440.

FUELING OFFICE:

Canal Dock, Long Distance 'Phone 320.

EVERY ENGINEER

who wants to get to
the top of his profes-
sion wants this book.
It is the latest and



BEST AMERICAN PRACTICE.

Fully illustrated.
Cloth, \$1.00.
Copies mailed post-
paid on receipt
of price.

SPOON & CHAMBERLAIN,

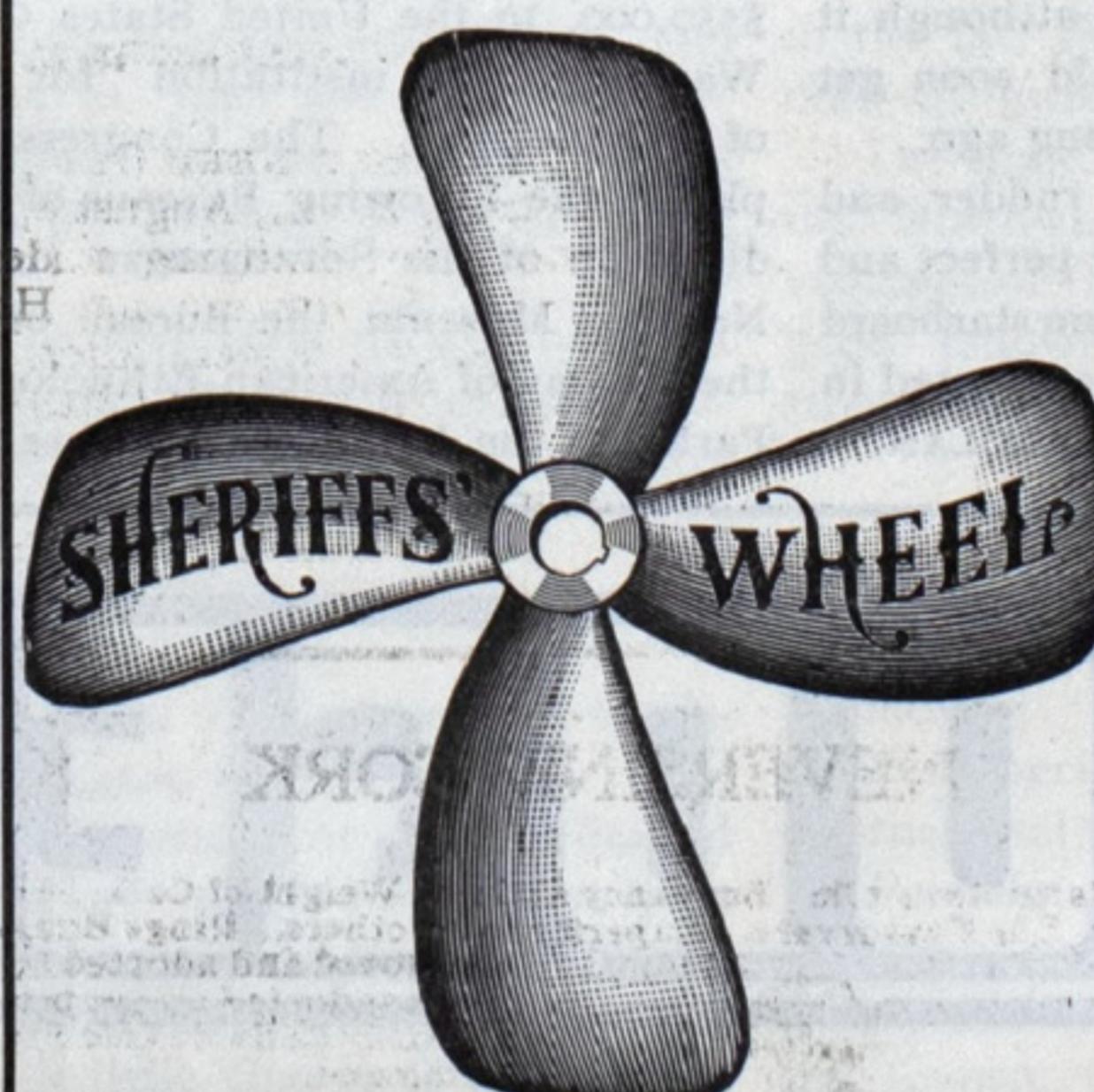
Publishers,

12 Cortlandt Street,

NEW YORK, U. S. A.

SHERIFFS MFG. CO.

ESTABLISHED 1854.



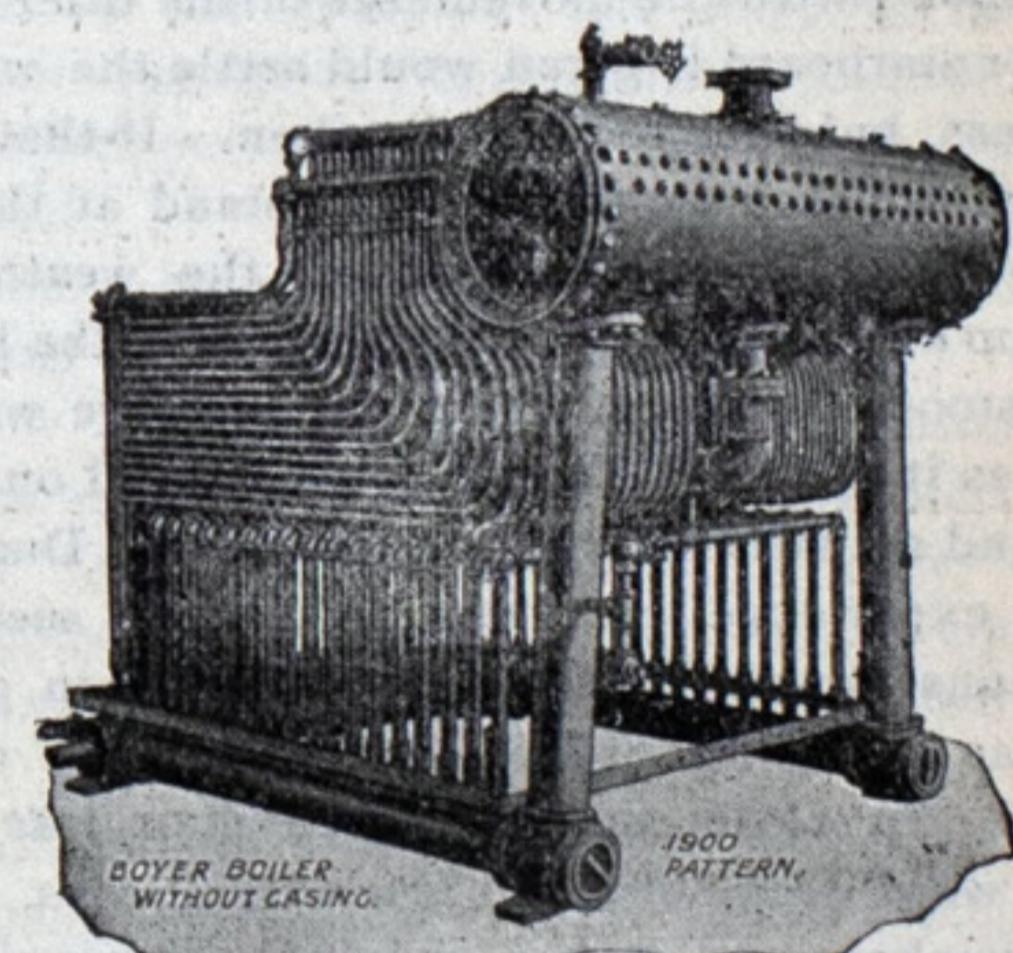
MILWAUKEE, WIS.

Twenty-Day Limit Tickets

after August 19th, to Buffalo and return, will be sold for one and one-third fare via the Nickel Plate Road. See nearest ticket agent, or address E. A. AKERS, C. P. & T. A., Cleveland, O.

153-35

JOHN E. THROPP & SONS CO.,
TRENTON, N. J., U. S. A.



BUILDERS OF
SINGLE, COMPOUND AND TRIPLE EXPANSION
ENGINES.

CONDENSERS.

BOYER SECTIONAL WATER TUBE
BOILERS.

PROPELLER WHEELS.

MACHINERY COMPLETE FOR PLEASURE
YACHTS, TUG BOATS AND LIGHT DRAUGHT
PASSENGER BOATS.

Special Local Sleepers.

Train leaving Cleveland at 7:50 p. m. for Chicago, return trip leaving Chicago at 8:35 p. m. via the Nickel Plate Road, now carries extra local sleepers between these points affording ample room for all. For specific information call on nearest agent, or E. A. AKERS, C. P. & T. A., Cleveland, O. 145-33

ENGINEERS' LICENSE.

MECHANICS, ENGINEERS, ELECTRICIANS, FIREMEN, ETC.

New forty-page pamphlet containing Questions asked by Examining Board of Engineers. Sent free. GEO. A. ZELLER, Publisher, Room 358, 18 South Fourth Street, St. Louis, Mo.

BOAT-STOPPING APPARATUS IN NORWAY.

A resident of Sweden, Count K. A. Posse, has invented a boat-stopping apparatus which will prevent collisions and facilitate the maneuvering of large vessels.

Recent experiments have been made on a steam launch accommodating 160 persons, with an engine of 30 indicated horsepower, making 9 knots an hour.

The new apparatus consists of shutters, applied on the starboard and port sides, about one-fourth of a boat length from the stern. These can be opened and shut by means of a lever applied on the deck and placed so as to be easily maneuvered by the helmsman. The shutters consist of two quadrilateral steel plates, with special packing boxes in the so-called shutter houses. Experiments showed that when the launch was going at full speed, it could be stopped in fifteen seconds at half a boat length by reversing and extending the shutters.

The apparatus may be applied to any steamer. The invention has been patented in all the leading countries.

THE Ontario Commissioner of Crown Lands has received a copy of a pamphlet in French, which has been issued by M. Romanet du Gailland of Paris, France, on nickel deposits of the Sudbury region. M. Gailland speaks of the Sudbury nickel deposits in the highest terms and regards prospects of a great development of them as most encouraging to Canada. He also refers in terms of approbation to the energy with which the enterprises of Mr. Clergue in connection with development of the nickel and steel industries are being conducted. Mr. Clergue's railway enterprises, and especially the Manitoulin & North Shore line, are regarded by M. Gailland as factors of the utmost importance in opening up the rich natural resources of this section of Ontario. In

view of the fact that the only other known nickel deposit of any extent in the world, at New Caledonia, is under French control, this testimony by an expert of standing in France of the value of our nickel deposits is, says the Canadian Manufacturer, accepted by the Crown Land Department as especially gratifying.

DENMARKS COMMERCE WITH GREENLAND.

Consular Agent Harris writes from Eibenstock: The exports from Denmark to Greenland are principally food stuffs, firearms and ammunition, woolen goods, implements, and tobacco. Greenland exports to Denmark hides and skins of animals abounding in that region—such as the bear and seal—and whale oil and eiderdown. About 30,000 seal skins are sent to Denmark each year. In 1900, Denmark received 2,600 skins of the blue and white arctic fox, which were assorted and sold in packages of 10 each. The commerce of Greenland is monopolized by the Danish government. The Royal Danish-Greenland Company has 9 ships—5 brigs (each nearly one hundred years old), 3 barks, and 1 steamer. Ships of other nations cannot touch at the ports of, nor travelers visit, Greenland without the consent of Denmark.

Shipping—Construction of Charter—Covenant for Docking—Damages for Delay Occasioned by Foul Bottom.—A charter of a steamship for a period of about six months, hire to continue until her redelivery at some designated port, contained a provision that "steamer is to be docked, bottom cleaned, and painted whenever charterers and master think necessary, at least once in every six months, and payment of the hire to be suspended until she is again in proper state for the service." At the expiration of six months the ship was in a South African port, and the charterer desired to bring her to the United States for

redelivery. She had not been docked or cleaned during the term of the charter, and the charterer demanded that she be taken to Cape Town and docked. The owner refused, and the ship was delayed on the passage home on account of the foul condition of her bottom. Held, that the charter provision was, in legal effect, an absolute engagement on the part of the owner to have her docked and cleaned at least once in six months, or else to allow the charterer his actual loss resulting from the failure, and that such provision continued in force so long as the hire continued; that neither the fact that the master did not deem the docking necessary nor that she could not be docked at Cape Town released the owner from such engagement. Falls of Keltie S. S. Co. vs. United States & Australasia S. S. Co., 108 Fed. Rep. (U. S.) 417.

Salvage—Evidence.—A steamer at Cape Nome became partially disabled by the breaking of two of her four propeller blades. The place had no harbor, and when visited by storms all the vessels that were able to do so were compelled to go to sea. The disabled steamer was able to do so. The steamer carried more canvas and was better rigged for sailing than most steamships engaged in commerce on the Pacific Ocean. On the return voyage to Seattle the captain made an arrangement with the master of another steamer to be convoyed and towed if necessary. After leaving Cape Nome, such other vessel took the disabled ship in tow. The weather was pleasant, and when near Dutch Harbor the tow lines were let go, and each vessel proceeded independently into that port. The towing steamer was short of fuel, and on arriving at Dutch Harbor her supply of coal was nearly exhausted. Thereafter the disabled steamer started in tow of the other vessel for Seattle. Before completing the run, a third blade was broken off her propeller. Held, that though, in view of the moderate weather which prevailed, it was probable that the ship would have made a port without aid from any other vessel, still, as she was partially disabled, and was in a place where violent storms were to be expected at that time of the year, it constituted a salvage service, though not of a high order of merit. The Santa Ana, 107 Fed. Rep. (U. S.) 527.

**THE CHASE MACHINE COMPANY,
ENGINEERS AND MACHINISTS.**

MANUFACTURERS, UNDER THE CHASE PATENTS, OF
Fog Whistle Machines, Hoisting Engines, Steering Engines
Power and Drop Hammers, and other Machinery.

111 ELM STREET.

TELEPHONE, MAIN 994.

CLEVELAND, O.

JOHN DONNELLY, SR., PRES.
JOHN DONNELLY, JR., VICE PRES.

H. B. FOLGER, TREAS.
THOS. DONNELLY, SECY.

**THE DONNELLY SALVAGE
AND WRECKING CO., Ltd.**

KINGSTON, ONT.

EXPERIENCED DIVERS, TUGS, STEAM PUMPS, ETC.,
SUPPLIED ON SHORTEST NOTICE.

LAKE TOURS.

For further particulars see
"Passenger Lines on the Lakes,"
page 18.

BETWEEN

DETROIT AND CLEVELAND.—Detroit & Cleveland Navigation Co., Detroit.

CLEVELAND AND CANADA.—Lake Erie Navigation Co., Walkerville, Ont.

CHICAGO, MILWAUKEE AND MICHIGAN PORTS.—Goodrich Transportation Co., Chicago.

CLEVELAND AND BUFFALO, N. Y.—Cleveland & Buffalo Transit Co., Buffalo.

TORONTO, MONTREAL, AND QUEBEC.—Richelieu & Ontario Navigation Co., Montreal.

CHICAGO, ST. JOSEPH AND BENTON HARBOR.—Graham & Morton Line, Benton Harbor, Mich.

TOLEDO, WINDSOR AND SAULT STE. MARIE, ALSO "SOO" TO MICHIPOCOTEN.—Algoma Central Steamship Line, Sault Ste. Marie, Ont.

BUFFALO, CLEVELAND, DETROIT, "SOO," AND DULUTH.—The Erie & Western Transportation Co. (Anchor Line), Buffalo.

CHICAGO, CHARLEVOIX AND MACKINAW.—Manitou Steamship Co., Chicago.

TOLEDO & SARNIA, DETROIT & ST. CLAIR RIVER PORTS.—White Star Line, Detroit.

BUFFALO, CHICAGO AND INTERMEDIATE PORTS OF CALL.—Northern Steamship Co., Buffalo.

**PRACTICAL
MECHANICS.**

Applied to the requirements of the sailor. By Thos. McKenzie. Illustrated; 12 mo.; cloth, \$1.50, by mail, prepaid. The Marine Record, Western Reserve Bldg., Cleveland, O.

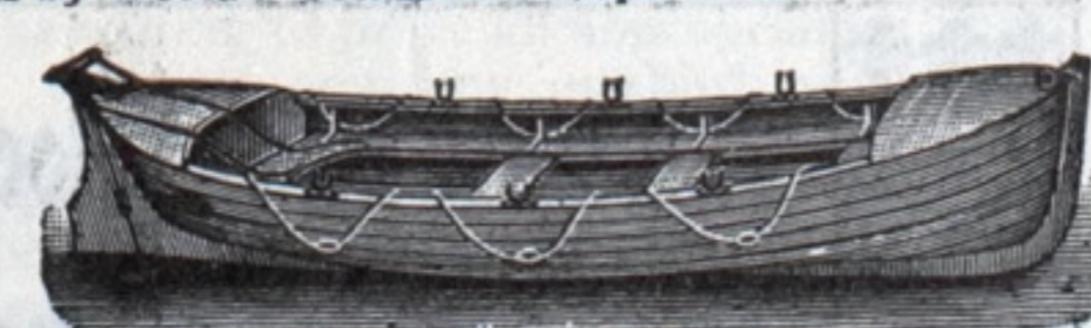
Government Proposals.

U. S. ENGINEER OFFICE, Jones Building, Detroit, Mich., August 8, 1901. Sealed proposals for dredging under continuing contracts, for improving Hay Lake Channel, St. Mary's River, Mich., will be received here until 12 noon (Standard time), August 31, 1901, and then publicly opened. Information furnished on application. J. G. LYDECKER, Col., Engrs. 33-35

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full weight of Cork, as required by U. S. Inspectors. **Consolidated Cork Life Preservers.** Superior to all others. **Rings Buoys and Fenders.** SAFEST CHEAPEST. Approved and adopted by U. S. Board of Supervising Inspectors. Also adopted by the principal Ocean, Lake and River Steamer Lines as the only Reliable Life Preserver. Vessels and trade supplied. Send for Catalogue. Awarded four medals by World's Columbian Exposition.

METALLIC
and
WOODEN
LIFE
BOATS.

**Metallic Life Rafts, Marine Drags.**

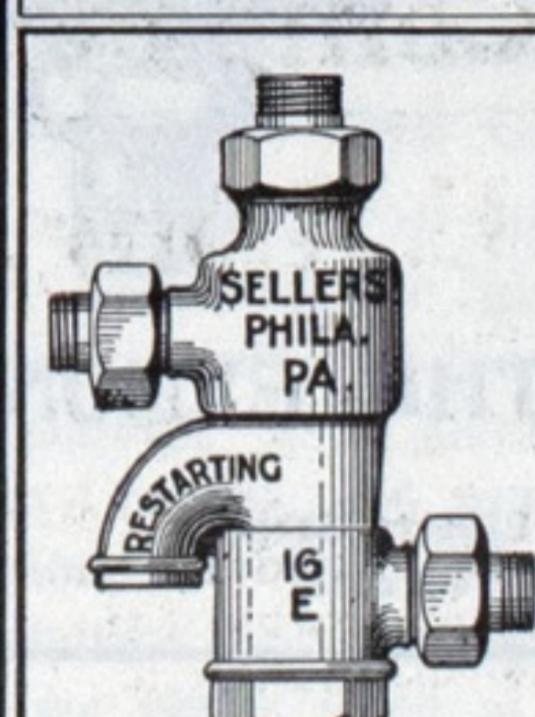
Manufacturer of Woolsey's Patent Life Buoy, which is the lightest, cheapest and most compact Life Raft known. Send for illustrated catalogue. Get our prices before buying elsewhere.

IF U Want a PUMP or SYPHON

Write to the E. W. Vanduzen Co. of Cincinnati, O., for their catalogue 76. They give you facts and figures about their Steam Jet Pumps. A postal will bring full information by return mail free of charge.

THE E. W. VANDUZEN CO.,
Cincinnati, O.

D. KAHNWEILER'S SONS, 437 Pearl St. New York City.

Sellers' Restarting Injector

A strictly first class machine at moderate cost.

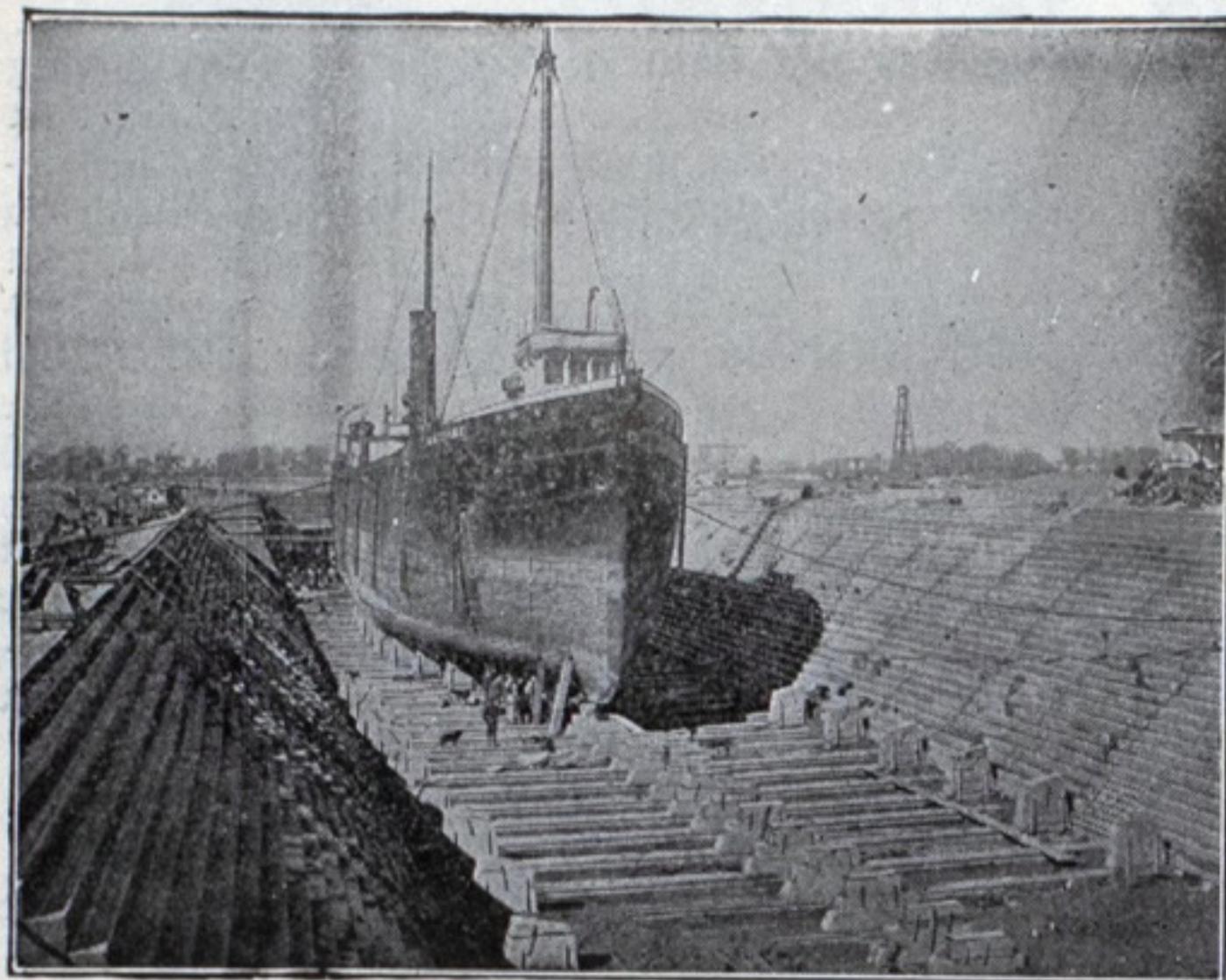
Perfectly automatic, has wide range of capacities, and raises water promptly with hot or cold pipes.

Very simple, has few parts and is easily repaired.

All parts interchangeable, made of the best bronze, and the workmanship is perfect. Send for special catalogue descriptive of this Injector.

JENKINS BROTHERS, Selling Agents
NEW YORK, BOSTON, PHILA., CHICAGO





Craig Ship Building Co.

TOLEDO, OHIO

New Dry-Dock 450 feet long, 110 feet wide on top, 55 feet wide on bottom, 16 feet water on sill.

Repairs to Metal and Wooden Ships
a Specialty.

Metal and Wooden Ship Builders.



Standard Books on Marine Subjects.

NAVAL ARCHITECT'S AND SHIPBUILDER'S POCKET BOOK. Clement Mackrow. Formulae, rules and tables, and marine engineers' and surveyors' Handy Book of Reference. Fifth edition. 700 pages; pocket-book form. \$5.00.

A MANUAL OF MARINE ENGINEERING. A. E. Seaton. Designing, construction and working of marine machinery. \$6.00.

NAVAL ARCHITECTURE: A MANUAL ON LAYING OFF IRON AND STEEL VESSELS. Thos. H. Watson. Valuable for naval architects as well as beginners in ship yards. \$5.00.

RESISTANCE AND PROPULSION OF SHIPS. By William F. Durand, Principal of the School of Marine Construction, Cornell University. 431 pages, 116 figures. \$5.00.

PRACTICAL ADVICE FOR MARINE ENGINEERS. This is a valuable little book, with 64 illustrations. By Charles W. Roberts. \$1.00.

MODEL ENGINES AND SMALL BOATS. N. M. Hopkins. New methods of engine and boiler making; ship design and construction; fifty illustrations. \$1.25.

Sent to any address, prepaid, on receipt of price.

The Marine Record Publishing Co.

Western Reserve Building,

CLEVELAND, OHIO.

STARTED,
REGULATED,
STOPPED
With One Handle.

THE EYNON-KORTING COMPOUND INJECTOR.

The BEST for Stationary, Marine or Locomotive Service.

Takes water of a temperature of 150 degrees.

Will Lift Water 24 Feet.

Has a Greater Range than any other Injector.

No Adjustment Required for Steam Pressures Varying from 15 to 300 Lbs.

Send for General Catalogue covering the
Specialties.

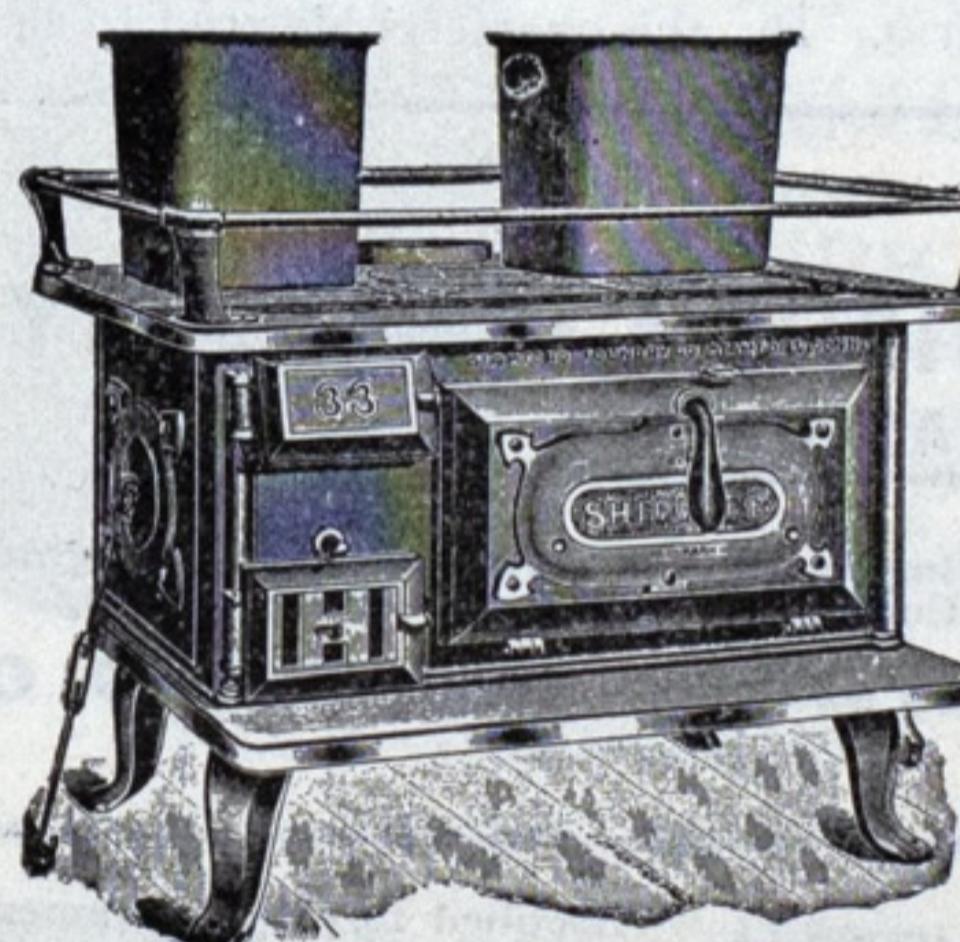
THE EYNON-EVANS MFG. CO.
15th and Clearfield Streets,
PHILADELPHIA, U. S. A.

New York Office, 107 Liberty Street.
Boston Office, 42 Oliver Street.

W. S. JENKS, President.

O. L. JENKS, Vice Pres. and Treas.

A. M. CARPENTER, Sec. and Gen'l Mgr



SHIPMATE RANGES.

Some of the earliest vessel ranges were made very heavy throughout, and while they were very substantial and durable they were unnecessarily costly.

By putting the extra weight in the parts where it is really needed, and making the other parts only so heavy as necessary, an equally substantial range can be made for considerably less cost. This is the plan of the Shipmate.

The Tinnerman Steel Range Co., 797-803 Lorain Street, Cleveland, have a full assortment of these ranges, and can fill orders for any size. They are sold also by

Robt. C. Bialy, 923-925 Water St., Bay City, Mich.
Soo Hardware Co., Sault Ste. Marie, Mich.

THE STAMFORD FOUNDRY COMPANY,
STAMFORD, CONN.

Established 1830.

The Jenks Ship Building Co.

Office and Machine Shops
Fourth Street.

Yards
Foot of Lincoln Ave.

Steel and Wood Ship Builders.
Marine Engines and Boilers.



Port Huron, Mich.

—STEAM WINDLASSES CAPSTANS AND STEERING APPARATUS—